OVERSIGHT ON RURAL ENERGY NEEDS

HEARINGS

BEFORE THE

SUBCOMMITTEE ON RURAL DEVELOPMENT,
OVERSIGHT, AND INVESTIGATIONS

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NUTRITION, AND FORESTRY
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OVERSIGHT ON RURAL ENERGY NEEDS

TUESDAY, MAY 25, 1982

U.S. Senate,
Subcommittee on Rural Development,
Oversight, and Investigations of the
Committee on Agriculture, Nutrition, and Forestry,
Washington, D.C.

The subcommittee convened, pursuant to notice, at 1:40 p.m., in room 324, Russell Senate Office Building, Hon. Mark Andrews (chairman of the subcommittee), presiding.

Present: Senator Andrews.

STATEMENT OF HON. MARK ANDREWS, A U.S. SENATOR FROM NORTH DAKOTA

Senator Andrews. The subcommittee will come to order.

I appreciate your coming today. Let me, by way of explanation, point out that I arranged for these hearings for two different reasons. They are different, but closely intertwined.

For several years, particularly in the past 2 years, I have been worried about what I perceive to be the lack of a positive, coordinated, and determined policy that will make this country energy independent. Instead, I think these witnesses will discuss some areas of their expertise that will demonstrate that we have, instead, a piecemeal, costly and ineffective policy, if there is any policy at all.

As a person whose real profession is farming, I have a particular interest in making sure adequate supplies of energy of all kinds, and particularly petroleum products, are at the bulk station or on the farm during that very narrow window through which we farmers operate. If we cannot get our supplies of gasoline, oil, diesel, natural gas, and other fuels at the right times of the year, and we do not have a whale of a lot of leeway, we can lose an entire year's crop.

This basically poses a hazard twice a year, at planting and harvesting time. Again this year in my State, and I know it is occurring in many agricultural States around the country, we are experiencing some shortages again. They may not be of emergency proportions, but the existence, again, of these perennial shortages tells me that we have survived so far by pure luck, certainly not from planning or from any well-placed policy that can be relied upon.

Second, despite considerable progress in the area of getting rid of excessive regulatory and environmental requirements, we are still in a veritable sea of such obstacles acting in their own way to propagate further delays in development of energy independence and causing enormous economic loss to the Nation as a whole, and most particularly to the consumers of all kinds and sizes.

I fully recognize that some of the testimony here may well go beyond the purview of the Senate's Agriculture Subcommittee on Rural Development, Investigations, and Oversight, but so be it. I have never been bashful in the 20 years I have been privileged to be in Congress. I think the issue is so important that we should not worry about whether we are overlapping just a little bit.

We certainly have been meticulously careful in the selection of our witnesses so that they will address both the overall energy policy shortfall and its particular application to rural America.

Let me assure the subcommittee and the full Agriculture Committee, I have discussed the content of these hearings well in advance with my good friend and colleague, Senator McClure of Idaho, who chairs the full Energy Committee. He is understanding and totally supportive of this phase of hearings.

Let me explain a couple of other things. First, the Reagan administration has not been invited to participate in the 2 days of hearings and consciously so. It is my hope that appropriate spokesmen in the Departments of Energy, Agriculture, Interior, and the White House itself will find these transcripts of sufficient interest that response to the questions raised about energy policy, or the lack of it, will be forthcoming.

I extend that invitation either before this subcommittee or whatever committee in the Senate that would be the more appropriate one to study the subject in more detail, with legislation as a possible result.

Second, in compiling a list of spokesmen representing major sectors of the energy industry, I recognize some very important sectors were not invited, such as the LP gas people, and the oil and gas industry being two prominent examples. This was more by accident than design.

Let me say that we wanted to hear from industry people who represent the potential for substituting various forms of energy for gas and oil where such substitution is permissible and desirable.

You will also note that we have no representation from the rather substantial synthetic fuels industry, a sector which I fully support and with which I have great identity.

In short, the limitations of time during this busy part of the session, particularly scheduled as we are to be considering on the floor of the Senate the urgent supplemental appropriations bill dealing with all of the 13 functions of our Government, puts us on an extremely compressed time schedule, and this limitation forces us to draw the line with no offense meant to any single component of the immense energy industry.

We have today representatives from the electric utility industry, both investor-owned and cooperative; from the coal industry; and from the nuclear field. Tomorrow we will hear from advocacy groups, including consumers, farmer cooperatives, the Food & Energy Council, and a coalition organization known as Americans for Energy Independence.

I am delighted that several of my colleagues will be participating in either today's or tomorrow's hearing, and I beg the indulgence, of course, of the outside witnesses who I ask to defer whenever another Senator wishes to participate and can spend some time with us.

At this point, without objection, I will insert a statement by Senator Huddleston.

STATEMENT OF HON. WALTER D. HUDDLESTON, A U.S. SENATOR FROM KENTUCKY

Mr. Chairman: I've been in the Senate for almost 10 years now. Throughout that time, we have moved from one energy crisis to another with alarming regularity.

First, and most devastating, was the OPEC embargo of 1973; then the natural gas shortage in the winter of 1976-77, and the disruption of oil imports because of the Iranian revolution in 1979 and the Iran-Iraq war in the fall of 1980.

Each event brought with it supply interruptions, higher prices, and increases in unemployment. Our economy suffered dearly, and our national security was threatened.

But now, because it's been a while since we've had gas lines, because oil prices have fallen slightly this Spring, there are those who might think that we can abandon all of our painstaking efforts over the years to prepare for emergencies and develop alternatives to imported oil.

The administration proposes to dismantle the Department of Energy—an imperfect institution, I agree, but necessary to a coordinated energy policy.

The administration proposes to virtually eliminate Federal support of energy conservation, solar energy, and alcohol fuels. They have proposed near close-out funding levels for fossil energy. The President has vetoed standby petroleum allocation legislation.

This administration just seems to have a head-in-the-sand philosophy when it comes to energy.

Nothing could be more shortsighted. To follow such a course virtually assures that we will be more vulnerable than ever to the next supply interruption or price increase—and there will be another one.

OPEC just about has the oil glut dried up. Prices are stabilizing and, at their meeting in Quito, the OPEC ministers even felt confident enough to talk about the possibility of price increases later this year. If OPEC can do this during a worldwide recession, imagine what they may be able to do when the economy strengthens.

Actually, you don't have to imagine; you just have to remember.

With planning and coordination, the current relaxation of prices and ready supply could give us the breathing room we need to develop alternatives to imported oil.

But, absent a cohesive energy policy, the current situation is a double-edged sword of the most dangerous sort. It not only lulls us into a false sense of security regarding oil supplies, but also effectively undercuts any efforts we might make toward energy self-sufficiency by making them economically unattractive.

In this atmosphere of lower oil prices and high interest rates, Government direction and assistance are crucial to energy conservation and the development of alternatives to foreign oil.

At a time when we are importing 5 million barrels of oil a day, we still need an effective means of allocating energy if supplies should be curtailed.

First and foremost, we need an effective means of getting necessary fuel to our farmers. Farmers can't wait for a shortage to work itself out through the marketplace. Farmers can't afford to pay $3 to $4 a gallon for energy products. If it is time to plant, or time to harvest, farmers need fuel right away at an affordable price.

And, if rural American is forced to accept a curtailed rural electrification program, we will be further jeopardizing the long-term ability of our farmers to meet the growing demands for food and fiber.

The introduction of electricity to farms was among the most important contributors to the productivity of U.S. farm operations. Reasonably priced electricity is crucial in maintaining viable farming operations. In addition, access to technological advances in energy use is imperative if farmers are to experience future increases in productivity.

I thank the chairman for calling these hearings to examine these important issues.

Senator **ANDREWS**. Our first witness today is Dr. Richard Balzhiser, an eminent energy expert and vice president of research and development for the Electric Power Research Institute of Palo Alto, Calif.

Dr. Balzhiser, welcome to our subcommittee, and if you would come forward, and accept the seat right over here.

When we have people like you coming in from California where the weather has been warm and the sun has been visible, and I was there weekend before last, we find that we appreciate you so much that we want to make sure that you are in the right glare of the television lights and the cameras are in focus properly upon you and will not miss any of the things that you have to say.

STATEMENT OF DR. RICHARD E. BALZHISER, VICE PRESIDENT OF RESEARCH AND DEVELOPMENT, ELECTRIC POWER RESEARCH INSTITUTE

Dr. **Balzhiser**. Thank you, Mr. Chairman. It is my pleasure to be here before you.

The weather that I left was, indeed, warm, 100 degrees, but I assure you it is not always like that. We have had a rather wet winter, which your constituents may very well appreciate.

Senator **Andrews**. Well, a lot of my constituents are out there in California.

Dr. **Balzhiser**. I am Richard Balzhiser, and I am vice president of research and development for the Electric Power Research Institute. We were created in 1973 to plan and manage centralized research and development efforts on behalf of the entire electric utility industry.

Our present program, to give you some perspective on activities, is funded at a level of $300 million, and by voluntary contributions from all sectors of the utility industry.

In my testimony today I intend to review electricity's contribution to the economic productivity and its effectiveness as an alternative to oil. I will then briefly summarize the many promising technologies for productive end use using electricity and efficient power production and delivery in both centralized and dispersed applications.

Finally, I intend to stress the critical importance for the Nation to preserve the technological options for electricity production that use domestically abundant resources, namely coal and uranium.

Energy and food are two of the most important issues facing the world today, and more fundamentally, energy is an essential input to agricultural production and food processing and distribution.

Furthermore, in the United States, electrification has been a major contributor to the modernization of rural communities and the productivity of the agricultural sector to such a degree that we in the United States are now the largest food exporter in the world.

It is, thus, extremely important for the United States and the world to insure an adequate energy supply for our food-producing sector.

The 1973 oil embargo and the subsequent dramatic increases in oil prices thrust the energy issue into national and, indeed, global attention. These energy price shocks have been major contributors to the current worldwide economic recession, which in turn has reduced oil use and resulted in a short pause in the continuous rise of world oil prices.

However, this oil price stabilization, in my opinion, is transitory. The fact is that the United States and other oil importing nations today are no less dependent on oil imports than they were just before the 1973 oil embargo.

Although total oil imports peaked in 1977, the United States still imported 29 percent more crude oil in 1981 than we did in 1973. During this period, oil imports from OPEC, including both crude oil and products, have increased 11 percent, while those from Arab OPEC more than doubled, essentially from 1 million to 2 million barrels a day.

Other industrialized countries had similar experiences. World oil prices still depend largely on OPEC policy in general, and on the Middle East political stability in particular.

A just published major study on world oil by Stanford University, commissioned by the Department of Energy, the Gas Research Institute, and ourselves, EPRI, pointed out that under a wide range of plausible oil supply and demand scenarios, world oil prices will not decline beyond 1985 and will return to a steep climb for the balance of this century. And I might add that by a steep climb, steep increase, they are suggesting something no less than 3 percent in real terms per year. This, I point out, will occur even if an appreciable synthetic fuels industry develops prior to the year 2000.

Senator ANDREWS. Well, Doctor, you are saying then 3 percent in real terms. That is discounting inflation. You are going to have a 45-percent increase in fuel prices by the end of this century because of the added difficulty of getting adequate supplies, not just because of inflation.

Dr. BALZHISER. Their analysis says that they would expect about a doubling in the real price of oil by the year 2000. It is $60 a barrel in 1980 dollars.

Senator ANDREWS. My 3 percent times 15 years forgets to take into account that each year you compound.

Dr. BALZHISER. That is right.

Unfortunately the temporary lull in oil prices has once again lured our Nation into an attitude of alarming complacency, in spite of the fact that the last sharp increase in oil prices happened only 2 years ago and the fact that the energy portion of the U.S. import dollar has grown from less than 12 percent in 1973 to over 31 percent in 1981, and I think, Mr. Chairman, that point highlights the point you made in your introductory statement regarding the importance of returning to these concerns.

It is fortunate for the Nation that your committee has the foresight to examine the energy issue beyond the present, "oil glut," and to seek an energy policy that will not only insure an uninterrupted energy supply to our food sector, in the short run, but also enhance economic productivity, national security, and international stability in the longer run.

My testimony includes evidence that leads to two inevitable observations: First, electricity has been, and will continue to be, an effective and productive alternative to oil. Second, electrification has the potential to further increase economic productivity.

To assess the potential of electricity as an alternative to oil, it is useful to examine some historical background. Energy is a primary input to economic production. In the past, improvements in physical efficiency of energy conversion and use, as well as increases in economic efficiency from fuel substitution, have been major driving forces for U.S. industrialization.

It is not surprising, then, that over the last 50 years growth in the U.S. economy has been accompanied by improvements in energy productivity, resulting in a decrease in energy-to-GNP ratios of nearly one-half, from 46,000 Btu to 27,000 Btu per 1980 dollar of GNP for the period from 1930 to 1981. Over that 50 years, we have effectively improved our energy efficiency as a nation by reducing the consumption by essentially 50 percent.

This trend of increasing energy productivity is, in large part, the result of four factors, in all of which electricity has played a significant role.

First, major improvements in the thermal efficiency of energy conversion in large categories of energy use, such as electrical generation and railroad transportation where the shift from coal to diesel fuel has made a considerable difference.

Second, the changing composition of national economic output toward lighter, high-technology industries and services that use less energy per unit of output, on the average, than the industries that had dominated in the past. This change has been partly stimulated by electrification and the advances in electronics.

Third, the changing composition of energy use with the consumption of electricity and fluid fuels rapidly replacing the direct use of solid fuels, such as wood and coal.

Finally, the rapid expansion of technological innovation, particularly in the areas of motor drive, telecommunications, and information processing.

The last three factors, I believe, are of particular significance for electricity. They demonstrate that electricity is a highly productive energy form in the sense that its use is demanded by a vast number of economic production and consumption activities.

This interpretation is supported by the fourfold increase in electricity-to-GNP ratio from 1930 to 1981, and I might add that while the use of energy per unit of GNP has declined, the use of electricity per unit of GNP has increased rather dramatically. It is an important point which is often missed in many of the energy debates.

Electricity has been chosen over alternative energy forms to increase overall economic productivity. One need only reflect on the vast improvements in productivity, in safety, convenience and comfort derived from the electric light and the electric motor.

Let us now take a more detailed look at recent electricity substitution for nonelectric fuels, largely oil, in the economic sectors.

In the industrial sector, electricity penetration is further evidenced by the sharp increase in electricity's share of total energy supplied in the postembargo period: from 25 percent of industrial energy use in 1973 to over 33 percent in 1981. During this period, electricity consumption by industry increased 20 percent, while the direct use of oil decreased 12 percent, and I would add to that point, that when we look historically at this last decade, the use of electricity is very directly correlated with the level of economic activity in the country. It is a perfect linear relationship. As our economic activity picks up, electricity use increases proportionately.

There are numerous examples of electricity substitution in industrial processes. A major area of substitution in recent years has been process heating, an area that is traditionally dominated by nonelectric fuels and which accounts for about 20 percent of total industrial energy consumption.

Some of the reasons for this substitution may be cited here as illustrative examples of the advantages of industrial electrification.

First, electric heating can be generated within the material itself, thus providing a uniform volumetric deposition of heating energy, and I think the microwave oven, which graces many of our kitchens today, is an excellent example of one particular technology.

Second, electricity is also a highly directed form of energy, and for this reason it can be controlled precisely and efficiently. Furthermore, it is totally compatible with electronic control devices. This helps account for the growing popularity of computer-controlled electric heating processes.

Third, there is no inherent thermodynamic limit on the achievable temperatures that electric heating can provide, and unlike the fossil fuels which have a peak heating temperature of about 3,000°, electrical sources can go much higher and open up many new processing options to many of our industries.

These advantages translate into higher production efficiency, lower total energy cost, improved process flexibility, and product control. Consequently, from an overall economic productivity point of view, electricity often becomes the preferred energy input.

In the residential and commercial sector, electricity use increased from 49 percent of energy consumption in 1973 to 58 percent in 1981. During this period, electricity consumption increased 25 percent while oil use decreased 28 percent. Some of this change is obviously due to the conservation of oil, the rapid growth in electronic technologies. However, a major part is due to the switching to electricity in our space and water heating, an area that accounts for almost all of our residential use of oil.

Electric penetration in the transportation sector is still small, most of it going into mass transit, but as my testimony indicates, in percentage terms, it has increased rather dramatically, and clearly we have on the horizon the possibility of moving more aggressively into this sector with electric vehicle penetration.

Finally, there have been dramatic decreases in oil use for power generation in the electric utility sector. The fraction of electricity generated by oil decreased from more than 18 percent in 1973 to less than 9 percent in 1981. We have about halved our oil use.

From the above, it is clear that electricity has been and will continue to be an effective and productive alternative for oil. Furthermore, since electricity can be generated from a variety of domestically abundant fuels, oil consumption can be reduced directly by shifting to nonoil generation.

In this substitution and switching process, not only is total oil consumption reduced, but also more oil can be dedicated to applications that are most suited for oil, such as transportation fuels and petrochemical feedstocks.

An indication of the overall potential of using electricity to reduce oil consumption may be obtained from the results of a 1981 study that was commissioned by Westinghouse Corp.—I. A. Forbes, et al., "Oil Replacement—The Electric Alternative," ERG Inc., November 1981—and executed by the energy research group operating out of Waltham, Mass. That study showed that it is technically feasible to displace a substantial portion of current oil use by electricity with existing technologies. Specifically, savings of 8 to 12 quads per year, and that translates to 4 to 6 million barrels of oil per day, could be eliminated from today's oil consumption.

This can be broken down as follows: 2.5 to 3.3 quads in the residential and commercial sectors, mostly space and water heating. This is a sector in which substitution of electricity for the fluid fuels, oil and gas, has taken place rather dramatically over the last decade; 2.1 to 4.1 quads in the industrial sector, mostly in the steam and process heating; 0.5 to 1.5 quads in the transportation sector; and 3.0 quads in the electric utility sector.

These potential oil savings are equivalent to 25 percent and 35 percent of all U.S. oil use in 1980 or between 60 and 90 percent of our imports in 1980.

These results do not include the potential for indirect substitution, namely the displacement that natural gas would bring about if used in place of oil. For example, replacing all the natural gas used for electric power generation in the United States with coal, nuclear, hydro, solar and other sources would free almost 4 quads of natural gas for oil displacement in other sectors of the economy.

A recent EPRI study—H. Chao, et al., "Electric Power Growth Constraints and Oil Dependence," EPRI, January 1982—further indicates that an economically justifiable 20-percent increase in electricity consumption in the year 2000 could induce a 25-percent decrease in oil imports with a 17-percent decrease in world oil prices. Other studies sponsored by EPRI, the Government, private institutions, and others indicate similar results. Although there are uncertainties in these projections, it is apparent that the potential for economical replacement of oil by electricity is very substantial.

I might point out that the three studies I have referred to, the ERG study, the EPRI study and the Stanford study, are all consistent in their conclusions.

Let me now turn to the opportunities for increasing our overall economic productivity. There is a wide range of new technologies, most of them being aggressively pursued by EPRI, that can be available soon to enhance electricity's contribution to economic productivity and its effectiveness for oil substitution.

These technologies may be divided into two categories. The first relates to the actual use of the technology in the end use sector, and the second to the actual production of electricity.

In end use, versatility, controllability and other unique characteristics of electricity are spawning a large variety of new technologies for productivity improvement. We see great opportunities.

The following is a sample from some of the innovative electrotechnologies for general industrial use that also have special significance for the agricultural and food industries.

In high temperature applications, we see the potential of using induction heating, microwaves, electric arc furnaces for metal production, a technology that directly relates to stainless steels and other materials important in the food and beverage industries.

We also see the use of lasers and electron beams in our metal forming and fabrication processes, again, major industries that relate to the production of our agricultural machinery industry.

In low temperature applications where food processing represents one of the best examples, vacuum and microwave drying represent important options that, if more extensively deployed, could lead to improved productivity and lower cost.

Heat pumps for the industrial sector, which now permit us to make more effective use of low temperature, otherwise wasted, energy, offer another important opportunity in this sector.

The use of ultraviolet, infrared, and electron beam curing are other examples of electric technologies that can be used to displace directly fuel-fired heating, furnace type applications.

And in the electrochemical area where electricity has a unique potential to aid in the synthesis of organic chemicals as well as the plasma synthesis of organic and inorganic chemicals, many of which are important in the production of food, pesticides and other agricultural chemicals.

Finally, I would point out that automation and electromechanical applications offer many opportunities to our industries across the board: Improved electric motors which will cut the cost of electricity and improve our efficiencies; lasers for improved control and diagnostics; computer controlled devices; computer aided design and manufacturing which is just now beginning to have, in my opinion, an enormous effect on our industries; and we have all heard lots about the potential of robotics.

Many of these have significant applications to the agricultural irrigation, food processing, storage and refrigeration components of the food sector.

For the residential and commercial sector, electronic innovations in both computer and telecommunication technologies have the potential to significantly alter our lifestyle, particularly the service sector, and I believe that for our rural communities these same technologies will have an even greater impact over the decades ahead.

Furthermore, advanced heat pumps with electric resistance heat backup will provide highly efficient and economical space and water heating, which is particularly applicable and important in our dispersed rural settings.

For the transportation sector, electric vehicle and electric mass transportation systems both hold promises. More importantly, even without direct oil substitution, transportation energy consumption can be reduced by increased use of telecommunications.

For all of these sectors, load management techniques also provide tools for increasing the overall efficiency of our electricity use.

The other category that I want to speak to is the technology related to the production and delivery of electrical energy, and none of these innovative end uses can be applied without an adequate electricity supply.

It is important to point out that electricity can be produced from a wide variety of domestically abundant, nonoil resources, including uranium, coal, hydro, geothermal, other renewable resources, such as solar, wind and biomass, and ultimately perhaps from water itself through the process of fusion.

For the foreseeable future we now are critically dependent on coal and nuclear, the technologies that we now know how to use, even if we do not seem to have the will to use them. Although many new and dispersed energy sources are being touted, all credible analyses show clearly that we must have new central station powerplants to provide the backbone of our electricity supply capability for the next several decades.

In the near and intermediate term, essentially for the next 10 to 20 years, EPRI concentrates on the productivity improvements and regulatory acceptability of existing generation technologies, and the development of technically feasible alternatives, such as fuel cells, fluidized bed combustion, gasification combined cycles, wind generation, and improved light-water reactor technology. Several of these have modular design suitable for dispersed applications, and that is particularly true of the fuel cell.

In the long run, EPRI endeavors to make many advanced technologies, notably the breeder, fusion, and solar, economically competitive so that the Nation can have access to virtually limitless energy sources.

We also work on advanced transmission and distribution concepts to increase the efficiency of our electricity delivery systems, and one of the more exciting developments in this field, and again one that I think will be of particular benefit to our rural communities, is the development of amorphous steel, essentially a new class of materials that greatly improve efficiency in the distribution of electricity.

I have presented only a brief summary of some of the major promising technologies for productive electric end-use and more efficient power production and delivery. We would be happy to supply additional details to you or your staff on request.

Both the desire for sustained economic growth and the need for reducing oil imports will contribute to increase demand for electricity. Regardless of the changes in institutional arrangements of the electric utility industry or the physical configurations of the power systems, an adequate, economical supply of electricity generated from domestically abundant resources will be critical to the Nation's future well-being.

At the present time, the United States has a plentiful supply of coal and uranium. Renewable and other advanced generating technologies will not make significant contributions to electricity supply on a national scale until after the turn of the century, at the earliest.

However, today implementation of these two key existing generating technologies is bogged down in regulatory processes, nuclear power being a prime example. Virtually all energy experts agree that nuclear power should be the economic choice among all baseload generating options, if the regulatory process is stabilized so schedule certainty is attainable and continuing backfitting eliminated.

Nuclear power is also the most environmentally benign among all available generating technologies today. In the last 15 years, continual uncertainty and inconsistency in regulatory policies have eroded both the economic advantage and the public confidence in nuclear power.

Worst of all, current regulatory processes, based on an adversary principle, literally inhibit innovative changes by the electric utility industry and its suppliers to improve nuclear plant safety and productivity, and I might point out this is in sharp contrast to what is happening in many other parts of the industrialized world, and more importantly what is happening in those countries that are emerging from the less developed status.

Ever changing environmental regulations have significantly increased the costs of power generation from coal since the 1960's. Recent Government concern on the issue of acidic deposition could greatly increase the future costs of coal use. It is important to point out that many of the most important safety and environmental concerns regarding electricity supply, whether from coal or nuclear, can be and are being managed technically and economically through our concentrated R. & D. effort.

What undermines the viability of these technologies and the ability of the electric utility industry to reduce electricity cost is the vacillating and adversarial nature of policymaking, regulation, and the lack of cohesion and long-term focus in our national energy policy.

I am sure that other expert witnesses following me here today will address these latter issues more fully.

Nevertheless, faced with the instability of oil imports and the uncertainty of future economic growth, I cannot overemphasize the importance for our Nation to preserve existing options for electricity supply so that we can have a greater control of our energy and economic destiny.

In conclusion, I see that electricity has been and will continue to be a major contributor to the growth in economic productivity and an effective alternative to oil, with substantial potential to reduce our vulnerability to shocks in oil price and availability. Concentrated research effort will further enhance the productivity increase and accelerate this substitution process. In this discussion, I have focussed mainly on technical and economic factors. However, electrification and substitution for oil, including the R. & D. support for technology development, contain large social and institutional elements requiring balanced policies derived in the best long-term interests of the United States and the world. A large part of the difficulties that may arise in future electricity supply originate in governmental processes. I hope that your committee's deliberations will revive the national resolve to develop a cohesive energy policy that includes vigorous pursuit of every avenue to remove the roadblocks to abundant energy supply and to help the United States achieve energy stability. Only through this achievement can we expect a reasonable chance of future economic prosperity and international harmony. Thank you.

Senator ANDREWS. Thank you very much, Doctor, for a most interesting and challenging statement.

I have a few questions that your statement brought to mind. Before I proceed on the questions, I am most happy that my colleague, Senator Burdick, is here.

Senator, would you like to make any statement?

Senator BURDICK. No, you finish with your questions. I will wait.

Senator **Andrews**. Well, Doctor, in your testimony you referred to a Stanford University study that your group commissioned that you say projects this steep climb in world oil prices beyond 1985 and for the balance of the century, giving a wide range of plausible supply and demand scenarios. I am assuming that among these scenarios are economic recovery and full employment, and that probably was taken into account.

Dr. **Balzhiser**. That is true.

Senator **Andrews**. That being the case, and since you state that energy is a primary input to economic production, I am concerned about energy shortages and corresponding price increases.

Can you give this committee some indication of the relative price stability of electricity versus other energy forms?

Dr. **Balzhiser**. Yes.

Senator **Andrews**. I guess projecting a little bit ahead of that, do you think now in 1982 there is the need for energy in the last decade of this century and by the year 2000, because of the time it takes to get these plants on the drawing board, into construction and finished, so that they will be there at the lowest possible net cost to the consumer in the future? If your figures are correct, it would seem to indicate that we ought to be looking at laying down a whale of a lot more plants than we seem to be doing right now.

Dr. **Balzhiser**. There are those, certainly, Mr. Chairman, that would agree with that statement, your point, that it takes, let's say, 8 to 15 years for us to plan, design, construct, and start up coal and nuclear plants in today's regulatory environment. It makes it clear that our position for 1990, essentially 8 years out in the future, if we are going to use other than the fluid fuels, oil and gas, if indeed we are going to use coal and nuclear, those plants must already be in the pipeline and underway.

So the die is virtually cast and we will be concerned with what happens in the decade beyond.

I would speak to your other point with regard to the stability of the price of electricity relative to other energy forms by simply pointing to the record. Electricity over the last several decades, I think if you check, you will find that the real average price of electricity today is the same as it was in 1960. None of the other energy forms, oil, gas, coal, come anywhere close to that. In real terms the costs of those fuels have increased, I would guess, certainly from at least a factor of 2 to perhaps as high as a factor of 4.

I think we have to recognize that in the case of electricity, which is a manufactured energy form, that a good bit of the cost traditionally is associated with the investment that must be made, and once that investment is in place, the consumer reaps the benefits for 30, 40 or even 50 years, quite apart from what happens to inflation, and historically fuel has been a very small percentage of the cost of electricity so that even if inflation affects the fuel prices, electricity does not feel it the same as the direct use of those same fuels would.

In that respect, yes, I think that the record shows that electricity prices have been stable rather to other energy forms, and I think the same logic, even with the kind of inflation and interest rates that we have been experiencing, over the long haul probably would have many of the same benefits.

But I would hasten to point out that a capital intensive technology clearly suffers in the environment in which it must operate today with very high interest rates, with very uncertain and increasing times for construction, so that the investments that are made for which the consumers must ultimately pay are just much, much higher than they should be, and I will point out much higher than our international competition is experiencing in their programs.

Senator **Andrews**. In your testimony you used the word "oil glut" when you referred to the present world oil situation. Can you quantify that so-called glut in terms of barrels of oil in storage, barrels of oil consumed, barrels of oil produced, or in any other terms that would give this committee an indication of how thin or how long term that glut really is?

We are beginning to hear, and the Washington Post, as a matter of fact, over the weekend had an article about the price of gasoline now going back up again and the glut is over. Is it, or what is the status, as you observe it?

Dr. **Balzhiser**. I do not profess to be an expert, and what I would prefer to do is to actually supply specifics in terms of the storage capacity, the magnitude of the pipeline, et cetera, supply that to you at a later date.

What I would like to offer though, consistent with your observation, one that we have just recently read in our papers in California, recognizing that this is May, the beginning of the season when gasoline consumption is expected to go up, not the tail end but the very beginning, already we have two of the major petroleum suppliers, Shell being one and I forget the second one, who have already had to curtail gasoline deliveries to stations in California.

So I think not only do we see a turnaround commencing in prices, but what we read in the papers in terms of the supply availability of refined products, if this is true, indeed, we may have more of a problem on our hands than any of us would have believed as recently as 2 weeks ago.

Senator **Andrews**. You mentioned also the fact that the nuclear generation of electricity is the safest and most environmentally secure method of producing power. A lot of people in this country would disagree with you on that. As a matter of fact, they just took an advisory vote around the Three Mile Island area, and many people point out that the casualties from that nuclear plant incident were not in anyone being damaged by radioactivity, but in the damage to the psyche of the people that lived in the area because of all of the rumors and the scare tactics and all the rest that were used.

As an energy expert and as the leader of the Electric Power Research Institute, what can be done to assure the public of the safety of nuclear generation and/or what can be done to enhance the safety of nuclear generation so these incidents do not continue and these suppositions do not gain widespread acceptance?

Should we standardize our plants? Should plants be operated by more competent operators? Where are we missing the boat, or are we missing the boat at all?

Dr. **Balzhiser**. Your point is certainly a valid one, Mr. Chairman, and one certainly cannot dispute the concern for the psychological well-being of people that live around powerplants. I think the record speaks for itself quite clearly, and I think that is unfortunate.

There are a lot of people in institutions that certainly are, in part, responsible for that condition. It is unfortunate that the record for nuclear power is not made clear in the media through the people who are in a position to present an objective and an unbiased assessment of nuclear power safety to the average citizen, who probably is not in a position to assimilate all of the seemingly conflicting evidence on the subject.

But the record is certainly clear in terms of the number of people who physically have been harmed in any way by the use of nuclear power.

I would remind you and others present that nuclear power to a thermodynamacist, and that is my background, is sort of the ultimate in the sense that unlike all of our fossil fuels where we burn and spew out the products of combustion, some of which are harmful and some of which are not, and if we retain all of the wastes and we retain it in such a way that we can control it, dispose of it in a manner that will not affect adversely the environment, this is the beauty of nuclear power that is not fully appreciated, in part because we have not as a nation had the will to go forward and demonstrate that, indeed, the control and disposition of radioactive wastes is both technically, economically, and publicly acceptable.

That is unfortunate. It has not been done, and it is being done in other countries of the world. We need to get on with it here.

As to whether or not industry can improve or do more to improve the acceptability of nuclear power, I would have to agree certainly it can, and I would not want to imply in my statement, which clearly focuses on some of the regulatory issues, that the industry itself is free from blame as to some of the problems that nuclear power is experiencing.

But I think it is fair to say, if you again examine the record, that the industry before, and certainly since, Three Mile Island has taken a number of steps to improve its own house, to get its own house in order so that the deficiencies that led to the condition at Three Mile Island will be much, much further reduced below what was already a very low probability in the first place.

Senator **ANDREWS**. Finally, you have implied that the Federal budget reductions in the area of research and development has cast doubts on the timely availability of many of the oil substitute technologies. To what extent do you feel that the manufacturing industry, the energy production industry, as well, and perhaps your own institute, is capable of or willing to pick up the slack so that such technologies, especially those that show near term profitability, can be developed within a reasonable time frame?

Dr. **BALZHISER**. Well, I think technologies that show near term, and by near term we are now looking at 5 years, profitability in today's economic climate probably will be pursued by industry. But I am much more pessimistic about longer term options and intermediate term options.

I think one must recognize that the companies that supply technology to the U.S. utility industry are by and large large, diversified companies. Many of them are looking for a whole array of business opportunities, and the energy sector is only one.

I am looking at companies like General Electric and Westinghouse, and if their stockholders' equity is better put in electronics or materials or something removed, broadcast, from the electric supply sector, I think you can expect them to do that. I think they have been remarkably faithful, given the somewhat uncertain outlook for future capacity requirements in this country in recent years.

But I am not at all optimistic that many of the technologies that are affected by the reduction in the Federal energy budget will be sustained through their efforts or, frankly, through our own efforts. We have had a number of rather large, aggressive programs that we cofunded. We work in a complementary manner with the Federal Government, and these cofunded efforts are going to be very difficult for us to sustain. We simply are not funded at that kind of a level.

The electric utility industry, which supplies us with the funds, in my opinion, has been remarkably faithful through these difficult times, but what we are anticipating is to simply hold our own in real terms, not increase, and with that kind of an outlook, I see no way of picking up the ball in areas like fuel cells or battery storage or even many of our advanced coal technologies.

So I do believe that the area of new technologies emerging from R. & D. is going to be affected by the change in the Federal budget.

Senator **Andrews**. And that would be a very worthwhile investment in the future of this country from the standpoint of the Federal Government.

Dr. **Balzhiser**. Yes, sir, I think it would be, and needless to say, we all have mixed emotions about this. Certainly we are not uniformly enthusiastic about all of the certain development that was part of the DOE program, and I am sure they are probably not enthusiastic about all of the research that is part of our program, but I think it is important to say that there were important components to that effort, and when one takes a reduction of the size that that budget has taken, certainly a good many of the very promising technologies are going to suffer.

Senator **Andrews**. Senator Burdick.

STATEMENT OF HON. QUENTIN N. BURDICK, A U.S. SENATOR FROM NORTH DAKOTA

Senator **Burdick**. Mr. Chairman and members of the committee, thank you for this opportunity to present views on energy policy.

Energy supply in the United States over the past 10 years has been alternatively described as a crisis, a problem, and the moral equivalent of war. Perhaps our choice of words has been unfortunate, since they construct a certain kind of momentum that cannot seem to be maintained over the longer haul.

Shortages and gluts are a transitory phenomenon, created by political decisions around the world, and often obscure the rational application of policy objectives.

It is human nature for us to think that we live at the center of history. Most times we do not. If the world were one big happy place, where hydrocarbon supply were allowed to flow freely to hydrocarbon demand, we would probably not have to give much thought to energy until the 106th Congress.

Some have said that if governments would just stay out of energy we would not have problems with energy supply. The fact is governments are not going to stay out of energy, for the same reasons Secretary Haig refused to rule out the use of our food supplies as an economic and political weapon as recently as Sunday. The OPEC oil ministers decided last week in Quito, Ecuador, to keep official production ceiling of 17.5 million barrels per day, and to keep its benchmark price at $34 per barrel, thus continuing the March 20 Vienna decisions.

OPEC has achieved its objectives for now. Two weeks ago Rotterdam spot market trading for the Saudi Arabian light crude hit $34 a barrel, up from a low of $27.50 in early March. Also, 2 weeks ago average gasoline prices across the United States rose by nearly an unprecedent 1 cent a gallon.

The oil glut is over, and OPEC has shown again its ability to influence the oil market. The British may raise their official crude price from $31 to $33, and Norway may also hike its North Sea prices soon.

Sheik Yamani of Saudi Arabia heads the long-term strategy committee for OPEC, and both have expressed concern about the development of synthetic fuels industries in the importing countries.

Fortunately, the Great Plains gasification project in our State, Mr. Chairman, is still all systems go. But two major North American synthetic fuels projects, Exxon's and Tosco's Colony oil shale venture in Colorado, and the Alsands tar sands project in Alberta, Canada, fell apart in the space of a few days.

In addition, the Australian partner in a venture with Japan's Mitsui & Co. to turn coal deposits in Australia into synthetic fuels announced that it is slowing down the project.

All that, Mr. Chairman, is evidence that we are not at a center of history in terms of the existence of hydrocarbons in the world. But, we were not at a center of history in those terms 10 years ago either.

The political forces affecting energy supply internationally that existed 10 years ago still exist today, and in some respects they are more institutionalized than they were. And the energy delivery system exists much the same today as it did 10 years ago. The energy supply and price shocks of the past 10 years will recur. I believe we should plan on that as if it were an absolute certainty.

Mr. Chairman, as you well know, we do not have in place any mechanism for dealing with an oil supply shortage. I believe we should have a stand-by plan at the Federal level to manage available supplies during the next shortage.

I spoke to that subject last year on the Senate floor. I was also pleased to cosponsor your bill, Mr. Chairman, to provide the President with the authority to deal with an oil shortage. The President's veto of that measure was very disappointing.

I believe in our market system as much as anyone, but our market system, particularly in energy supply, cannot be expected to make the arbitrary value judgments that have to be made during a short supply. During a shortage, someone will do without.

Market forces make cumulative judgments. It is easily conceivable that during a shortage the national interest may not correspond with pure market forces.

As a Senator representing a rural, agricultural State, I am acutely aware of one such circumstance.

Agriculture is one industry where it is literally true that at various times of the year a matter of days can determine the difference between a successful crop and a failure. As a farmer yourself, you know, Mr. Chairman, that in our State many farmers are poised this minute waiting for their fields to dry somewhat so they can plant their crops. They only have a few days to do it. Thirty days from now will be too late for many crops grown in our region. The fuel has to be there to get the job done, and fortunately, it is this year.

However, suppose next spring it is not. CENEX is the major supplier of farm fuels in our State. CENEX remains mostly dependent on the spot market, pending construction and operation of the northern tier pipeline.

Texaco and several other suppliers have withdrawn from North Dakota in recent years. The region is losing alternative routes of supply. During a short supply, companies who are not now serving our State and region cannot be expected to abandon their good customers in other areas to serve agriculture in North Dakota, even though agriculture would clearly be the highest and best use for the fuel during that short period of days.

By the same token, the customer-owned CENEX could not be expected to give up a portion of its supply to meet a critical need in another part of the country during a season when the need is not so acute in our region.

Someone or something has to make a value judgment during a time of shortage as to the highest and best use of gasoline and fuel oil. In my view, it probably should be the Federal Government.

Over the longer course, Mr. Chairman, I believe we should place more reliance on market forces to determine the price at the wellhead or mine-mouth for our hydrocarbons. If we look at the record from 1951 to 1981, price controls have not prevented higher prices. In fact, the record puts weight behind the argument that oil prices are higher than they would be had we not imposed price controls on oil in the early 1970's. We did become more dependent on foreign oil than we should have due to price controls. Fortunately, in the last 4 years we have been able to cut our oil imports by nearly half. But we need to continue that progress. I think over the longer term, we need to stick closer to market pricing of hydrocarbons.

Also, we need to be very careful in balancing our energy aims with our environmental goals. I do not think anyone wants to backtrack on the advances we have made in making industrial development compatible with a safe and clean environment. There is, in my view, no alternative to that effort.

The Senate Environment and Public Works Committee is in the process of reauthorizing several major pieces of environmental legislation. Among them is the Clean Air Act. The Clean Air Act is among the most complex of our environmental laws, and air quality is the most complex of our environmental sciences. I have an amendment pending, as you know, that would strike the short-term increments for class I air, while leaving the average annual increment in place.

North Dakota has the cleanest air in the Nation, in spite of the fact that we are a major energy producing State and a major agricultural State. Currently our continuing natural gas development in North Dakota depends on the construction of processing facilities. Three such plants are in limbo today due to the very restrictive short-term increments for sulfur dioxide emissions that could potentially affect class I areas. A coal-to-methanol project and a coal-to-electricity project are also stalled.

Again, the issue is very complex, and my amendment is little understood by the laymen. However, my amendment would probably permit this additional development, while according national parks with a level of protection far in excess of any alleged health effects to plant or animal life, and far in excess of any protections you or I enjoy.

Mr. Chairman, I also believe the Federal Government should find some way of maintaining some effective momentum towards moving us away from hydrocarbon dependency. Our coal, oil, and natural gas are finite resources.

As I mentioned earlier, we are not at a center of history in terms of their current existence. However, that point is inevitable. It is arguable as to when we reach it. But it is clearly not too early, in my view, to begin the transition.

There is an appropriate Federal role, I believe, in research, development, and commercialization of alternatives to hydrocarbon energy. We need to help establish an alternative energy industrial base.

We also need to improve the conservation industrial base. Conservation can extend the life of our existing resources. Modern technology can be aptly applied to conservation. The major Federal effort at this time may be most productive in fostering the conservation ethic.

Ultimately, conservation depends heavily on the consumers' conservation ethic, more so than price or any other determinant.

Mr. Chairman, thank you for your time and courtesy. I appreciate the opportunity to present my views.

Senator ANDREWS. Thank you, Senator. It is good to have such an excellent statement from my good friend and senior Senator.

Senator BURDICK. Thank you. It is a privilege to be here.

Senator ANDREWS. Our next witness is Mr. Robert D. Partridge, executive vice president and general manager of the National Rural Electric Cooperative Association.

Bob, you are no stranger to this hearing room. Welcome back. It is good to have you here, Bob. Your testimony is always very much in order and words that we look forward to hearing.

STATEMENT OF ROBERT D. PARTRIDGE, EXECUTIVE VICE PRESIDENT AND GENERAL MANAGER, NATIONAL RURAL ELECTRIC COOPERATIVE ASSOCIATION

Mr. PARTRIDGE. Thank you very much, Mr. Chairman.

I do appreciate the opportunity to testify before your hearing. I would like to submit for the record my entire statement, if I may.[1]

Senator ANDREWS. I can assure you that your entire statement will be included.

Mr. PARTRIDGE. The resolutions attached to my prepared text are resolutions out of NRECA's 40th annual meeting back in February.

Senator ANDREWS. Without objection, we will include them in the record.

Mr. PARTRIDGE. I appreciate that. They do deal with matters that are important to this committee but which I will not have time to discuss in any detail here this afternoon.

I do want to take time to express sincere appreciation to you and the other members of this committee for your great work and the strong support last year in the struggle to maintain a viable REA loans program. Your help was very much appreciated and absolutely essential.

The program last year, of course, sustained one of the most severe assaults in about a half a century. Changes in the REA loan program proposed by the Office of Management and Budget last year and again this year, would add millions of dollars to the energy cost to rural consumers without reducing the budget by one iota. You, and the majority of your colleagues in both the Senate and the House stood by the REA program, and we did prevail, and we are most appreciative of that.

Because of that effort last year, REA is able to keep doing the job that it was created by Congress to do back in 1936, and a job that will continue to need to be done as long as it is the goal of this country that all Americans, rural and urban alike, should have a reasonably equal opportunity to lead safe, helpful, and productive lives, enhanced by the availability of adequate, reliable, and affordable supplies of electricity.

We who work in the rural electric program have committed our best efforts toward making use of REA and the other tools which Congress has provided, and keeping the lights on and the power going to the 25 million rural Americans that we serve.

I am particularly appreciative that you have set these hearings. I think there is a need to examine the policy, the position and the posture, if you will, of this country, and in particular as that relates to the rural areas of the country, and we are hopeful that this inquiry will awaken people across the country with an awareness of some of the acute problems which we face and the absolute necessity for maintaining a position of energy self-sufficiency and independence and, at the same time, one that assures equity and fairness to the rural people of this country.

I do want to point out some of the very serious concerns that we have about the administration's continuing efforts to weaken and to reduce the REA financing program, a topic we think is directly related to the focus of this hearing.

Electricity has become the backbone of the entire system of rural energy. America's rural electric cooperatives and rural power districts serve most of the country's farmers and ranchers, and we need a a strong rural electrification program that maintains the technical and financial integrity of our rural systems as we continue to upgrade it through maintenance and construction and operation of distribution of power supply facilities.

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[1] See p. 81 for the prepared statement of Mr. Partridge.

It is our belief that without an adequate and fairly administered REA program there is no hope that rural people will ever achieve an equal footing with the rest of this country's consumers in terms of either energy supply or cost.

In the administration's proposals for fiscal year 1983 for the REA loan program, we once again find an array of proposed cuts and changes that would weaken the rural electric program very substantially and add significantly to the power costs that are being borne by the people of rural America. For the REA insured loan program and the loan guarantee program, our power supply financing, the cut proposed is almost 30 percent from the presently authorized level.

To justify those reductions the administration's spokesmen have portrayed rural consumers' rates as being lower than those being charged by other utilities. That is a remarkable assertion in light of the fact that the REA Administrator himself said precisely the opposite in an appearance he made before the House Agriculture Committee, when an ad hoc subcommittee of that group was considering the budget only a very short time ago.

We do not quite understand how it all adds up. More recently the Office of Management and Budget has been circulating on the House side some language which clearly is at variance with the facts and which suggests that the REA permits and encourages subsidized rates to rural consumers as a result of its loans program, a fact which simply does not exist.

The unfortunate fact is that rural people do, indeed, pay more for their electric service, about 12 percent more nationwide, than nonrural consumers in the same regions of the country in which the co-ops serve. Increasing the cost of REA loan funds would widen that gap clearly.

The administration has also stuck to its insistence that the REA loan program is in some way an unfair burden on the American taxpayer. In point of fact, REA, of course, does not utilitze a single tax dollar for its loans. Other than funds needed to cover the salaries and the expenses of REA, there are no appropriated moneys involved in financing the rural electric systems, and the REA programs operate totally outside of the Federal budget.

There is one new wrinkle in the arguments being used by the Office of Management and Budget and other spokesmen of the administration in justifying the cuts which they have proposed for REA. It is an incredible statement found on page 202 of the OMB publication called "Major Themes and Additional Budget Details," published in conjunction with the fiscal year 1983 proposed budget.

There under the heading of "Effects of the Proposed Change," the Office of Management and Budget says, in essence, that higher rates for rural consumers are "reasonable, because of the relative cost of providing service in less densely populated areas."

It would appear that OMB's position is the people of rural America should logically expect to pay more for the electric service that they need simply because they live in rural America. The implication is quite clear to a rural American: If you do not like it or cannot afford to pay it, then you had better start thinking about moving into the city.

For farmers, ranchers, and others out in rural America, that is not a viable alternative and certainly not for people whose roots are set deep in the rural communities in which they operate and in which they make their livings and raise their families.

The administration's continuing opposition to REA and to the rural electric program has baffled many of us. Administration spokesmen on the one hand have applauded the 1981 Economic Recovery Tax Act, which provided some very substantial subsidies through tax concessions to investor owned utilities and to others. We have no quarrel at all with the assistance which has been provided to the investor owned companies. Their problems in raising capital have been quite severe and are very well known, and they are of some substantial duration. They needed the kind of help which that tax bill gave them.

But rural electrics certainly have capital shortage problems, as well, and they are even more severe. But instead of a helping hand, the rural electric co-ops have been asked to pay even more for the capital that they have got to have, and we see that as lacking totally in justice and in logic as well.

In addition to our continuing concerns about the proposed reductions in the funding for REA, we are very much alarmed about a number of major policy and procedural changes which have been, or in some cases are apparently about to be, implemented by the administration.

Prominent among those are changes reportedly being considered which would abruptly and significantly increase the degree of outside or supplemental financing which borrowers have to acquire in conjunction with their REA loans.

One good case in point is a recent publication of a bulletin by REA which assigns to those systems formerly entitled to 2-percent loans because of low density or high plant to revenue dollar ratio, a requirement of 10 percent outside financing. It was our understanding that when the Congress agreed last year to leave the 2-percent loans on a discretionary basis, those systems that had previously qualified for 2-percent loans would receive all of their funding at 5 percent. That was a big jump even at that, a sizable increase in the cost of capital to them, considering the problems under which they operate.

Other recent policy changes arbitrarily exclude certain types of facilities and equipment from REA financing. Included in that prohibition are financing for headquarters or other buildings, structures of any kind, and for general utility plant and equipment, and there are some other categories, as well. Transmission facilities for distribution cooperatives have particularly been put under the microscope and in many cases are required to be eliminated from the financing. All those, of course, are utility needs which have to be met.

We believe very strongly that all of these facilities are integral parts of the country's utilities system, and we do not believe that separate and distinct categories should be established for the financing of various components of their electric plant.

There has also been and we have observed a distinct shift in REA's administrative policies relating to the loan guarantee program. We are deeply troubled by an increasing number of situations in which REA has insisted that certain portions of major projects, pollution control equipment in generating plants, for example, be financed separately and without the use of the REA guarantee.

Additionally, REA has made it quite clear that they will probably not finance any new participations in nuclear powerplants. We are, in fact, involved now with investor owned companies in a number of nuclear powerplants, and we will need to be involved financially and in an ownership sense in those in the future.

So this is one need of this country to make use of its own domestic resources and at the same time to be mindful of the energy needs of all sectors of our society, including the rural component.

Senator ANDREWS. Do you think this administration by its action in refusing to grant loans to those co-ops to join in building nuclear powerplants is adopting an antinuclear power policy?

Mr. PARTRIDGE. Certainly, de facto, it is a very negative factor. The fact is that these plants are so large they must almost inevitably be built jointly.

Senator ANDREWS. But why would the people in the bowels of the Office of Management and Budget be transmitting a totally different signal to the Rural Electrification Administration than the signals that I have heard from the President and the President's chief advisers which have been that nuclear power is a safe power, something we ought to go ahead and build more of?

Mr. PARTRIDGE. Indeed, the President has been quite unequivocal in his support of nuclear power, and we have been most appreciative of that. Somehow the message at the Oval Office does not seem to reach the Office of Management and Budget and on down from there.

Senator ANDREWS. He does not have that control over his minions that he should have?

Mr. PARTRIDGE. I am afraid the minions sometimes run in their own directions, it would seem, particularly on this matter.

Senator ANDREWS. But they are going in direct contradiction to the publicly expressed feeling of the President, not only during his campaign for election, but in anything he has said since he has been in the White House.

Mr. PARTRIDGE. That is quite right, Mr. Chairman. Indeed, they are. It is interesting.

We have been concerned also about some changes in REA policies and practices relating to loan accommodations and additionally the continuing line of reasoning that we hear periodically expressed from REA and from the Department of Agriculture, more especially the Assistant Secretary level at Agriculture, that the REA guarantee ought to be applied to some percentage less than 100 percent of the REA loans.

Clearly a move in that direction would make it difficult, and in some cases impossible, for even the most financially strong among the REA borrowers to exercise their non-REA financing options.

The administration has made it clear, as did its predecessor, that one of their goals is to ultimately wean the REA borrowers from their reliance on Federal credit. It would seem logical, that being the objective, that REA should be taking steps to make that transition easier and not more difficult.

We are concerned also about the length of time that it requires today to process loan applications. On the average, insured loans at REA today require about 6 months from time of receipt until they materialize into an accomplished loan, much more than that if there are any problems, such as a transmission line or headquarters facilities in them. That kind of delay is largely unnecessary and due at least in part to the fact that REA is operating substantially under its authorized personnel ceiling. This has made it necessary for borrowers in too many cases to obtain short term loans at interest rates currently around 17 percent.

I frankly do not see or understand why penalizing the rural electric program by adding on its burden is meeting the economic goals of the administration. It seems to me it would be counter to their objectives. I know of no investment which has had a greater positive impact on the economy as a whole than the increased agricultural productivity made possible by rural electrification, or, for that matter, anything that has done more to make possible the shift over away from liquid, fossil fuels of various kinds to electricity produced out of coal and nuclear, and those credit needs are being met for the cooperatives without use of a single tax dollar for REA loans.

The continuing assault on the REA loans program, I think, is one of the ways in which this administration has made it clear that the needs of rural America come very low on the list of priorities. This is a matter of concern to us all.

The experience of the past year has led many rural electric program leaders, including a very substantial number of those who were, at the outset, very strong supporters of President Reagan, to conclude that there is a serious and pervasive lack of understanding and regard for rural Americans among the top policymakers within the administration.

I think our people perceive that the administration is, in fact, making it much more difficult to meet the energy needs of this country on a dependable basis, and at rates that people can afford, and doing so unnecessarily we have said this quite candidly to our friends within the executive branch, but we continue to see them pressing on, particularly the budgetary people within the administration, toward ever more austere and more difficult policies and procedures.

There are, of course, other programs on which the squeeze have been felt programs with which this committee is well familiar. The Farmers Home Administration, their housing and economic development funds have been cut, and the interest rates on rural water and sewer systems have been tripled, I understand. All of that, of course, is happening at a time when record numbers of farmers and ranchers around the country are getting into financial difficulty, into bankruptcy in too many cases. Farm income, as the chairman knows so well, is down to about half what it was 3 years ago. Farm debt is now at more than $200 billion. That is an increase of 2½ times in just 5 years of time, and interest payments on farm debt are now about equal to net farm income. It is our concern that literally thousands of family farms will not survive this decade if this trend continues.

I am sure, Mr. Chairman, that you are familiar with the figures and the concerns in this respect and probably share some of the concern which I have expressed.

The forecast for the future for agriculture could be considerably brighter, we think, through the development and implementation of a strong rural energy policy built on a foundation that includes adequate, reliable, affordable supplies of power for all of rural America.

Dr. Balzhiser mentioned the possibility that we might fall into a trap with the current sufficiency of oil, forgetting the direction in which we must head. That is a concern which we share. Now is the time, we think, to consolidate the ground that we have gained in recent years in conservation, in supplemental energy resources, and to get a firm handle on all viable alternatives for imported oil.

We have got to be sure that our continued dependence on high priced overseas oil does not stiffle the economic recovery that is so vital to the survival of rural America, and to this country as a whole.

We do think that any new look at electricity's role in the total energy picture should not result in the abandonment of other energy alternatives to the use of oil. Rural electric systems throughout the country are leading the way in finding alternatives to the use of irreplaceable fossil fuels in the generation of electric power. We are involved in such things as the development of sunflower hulls as a boiler fuel in the Dakotas, compressed air storage in generating power in peak-load periods in the Midwest, and wind, geothermal, hydroenergy, the fuel cell, and many other things that we think have some potential for the future. We are going to continue to pursue that.

But I would not want to mislead this committee. We do, indeed, need to continue to look to the use of our domestic oil and our uranium resources for the bulk of our power, undoubtedly for the great balance of this century.

The beauty of electricity is that it can be produced with a wide variety of resources with which we are richly endowed. It is versatile and easily transportable—the most admirable of all energy resources in that respect. It can quickly be put to work to replace imported petroleum in a number of key areas, such as home heating and cooling, crop conditioning and processing and, to a lesser extent, in the transportation area as well.

The replacement of oil with electricity ultimately, we believe, could reduce petroleum usage in the United States by as much as about one-third from the present levels. That is, we think, a goal which is worth pursuing.

Mr. Chairman, I again express to you our appreciation for these hearings and our opportunity to participate in them. I would be glad to respond to any questions.

Senator ANDREWS. Thank you, Bob. As always, you have made an excellent statement.

The thing that bothers me in this whole business of Government help to build more generating plants or Government help to set up new synthetic fuel plants is the fact that in my other committee, in the Appropriations Committee, I serve on the Defense subcommittee. We have all of our four-star generals and Assistant Secretaries of Defense wandering in—not wandering in; as a matter of fact, coming in and making very compelling statements about how we must spend $24 or $25 billion this year for a Rapid Deployment Force, and we say, well, fine, Mr. Secretary. Why do you need a Rapid Deployment Force?

Well, we have to protect our rights in the Middle East, and of course, then the question goes: what rights?

Well, our rights to that oil supply over there. So here we are as a nation spending $24 billion to try to protect somebody else's oil and not willing to spend one-tenth of that here at home to develop our own energy alternate so that we do not have to rely on somebody else's energy, to do the coal research, to do the uranium fast breeder reactor, whatever research that we need, and that is pretty basic.

It is one of the things that does concern me, and hopefully the candor that you have expressed today might stimulate some thought among our colleagues across this country as to where our true goals lie.

You mentioned in your statement that the new tax concessions are provided to investor-owned utilities through last year's Economic Recovery Tax Act, resulting in a total subsidy to these companies of some $4 billion a year. Now, that is to stimulate, I would understand, the production of more electricity, more energy.

Certainly in light of what I have just said, I am not going to fault that, but can you elaborate on that a bit and compare, if you will, the extent of that subsidy with the assistance that is being withheld from the rural electric system generating plants and the rest?

As I remember, access to the FFB, the Federal Government makes a profit on every loan that goes through the FFB. Am I wrong on that?

Mr. PARTRIDGE. No; you are correct, Mr. Chairman. They profit by one-eighth of 1 percent on each of those.

Senator ANDREWS. And the reason that Mr. Stockman gives in wanting no more FFB loans is that he wants to cut down the total amount of borrowing across this Nation so that the credit load is reduced, but if you reduce that credit load, if you do not, in fact, borrow, it means you are not going to build those plants and it means we are going to be even more dependent on somebody else's energy than we are today.

Mr. PARTRIDGE. That is very true, and we are, as I mentioned, joint participants with many of the investor-owned companies in building these plants. We really cannot carry out our role as a partner with them on these plants absent the REA guarantee, and we think it makes sense from the Government's point of view. It certainly makes sense from the electric utility industry's point of view.

You mentioned the total assistance, according to the investor-owned utility industry. That is estimated to be about $4 billion per year, and as I said earlier, it is something that we supported.

The investor-owned companies have had a great difficulty. They have not been able to sell stock. They have not been able to borrow at reasonable rates, and it was an assistance which they needed. It does on a per meter basis considerably exceed the assistance which we have. Theirs averages out to something like $40 per year per consumer. We think it is well worth it for what it does.

Our assistance of all kinds through the REA program measures out to a little less than $10 per meter per year.

Senator **Andrews**. Now you made a statement that the retail rates being paid by the consumer-owned rural electric systems averaged 12 percent more than those of non-REA utility customers. In other words, given the fact that the rural systems have the advantage of REA financing but they are still paying more for their electricity than people who live in the cities. Why?

Mr. **Partridge**. The principal reason, of course, is the low density, a density which per mile of line is a little less than five consumers. By contrast, a typical urban type utility will average perhaps on the order of 40 consumers per mile of line.

The contrast is even sharper when you compare the investment required, about 15 to 1 in the case of a urban utility against that of a rural electric cooperative.

We do serve the very sparse rural areas, and it does cost more to serve them. It has always been, and it has been a policy that—that problem, that difficulty was intended to be offset by the use of the REA loans program. That has been the thing that has made it possible to serve rural America. We have not had rates that equal.

Senator **Andrews**. In other words, the effort of the rural electric program is to give rural residents electricity at comparably priced rates, not at any lower rates, not at a subsidy.

Mr. **Partridge**. You are quite right, Mr. Chairman.

Senator **Andrews**. As a matter of fact, they do pay about 12 percent more, on average, as you pointed out. That is just one way of giving them an incentive to stay in the countryside instead of crowding into the cities which are already overcrowded. It would probably cost the Government three times as much per capita if they were forced into the city than they are paying through rural electrification programs and other programs.

I appreciate again your being here. My apologies for this, but we have a supplemental appropriations bill on the floor. I happen to be the chairman of one of the subcommittees. All of the beeps and all of the rest that have been going on means we have a meeting with Chairman Hatfield and with the leadership that has been going on for 15 minutes and they are saying I have got to be there. So I have no choice other than to recess the committee for about 15 minutes. You can have a cup of coffee or something, and we will be back in about that time.

[Recess.]

Senator **Andrews**. The subcommittee will again come to order. I found out one thing about the Senate as opposed to the House. The Senate tries to operate always in a deferential way toward all of the Members, and sometimes that means it takes forever and a day to get something worked out. We are in the process of trying to work out the supplemental appropriations bill and under what conditions. I assure you that those conditions have not been worked out yet. There are about seven amendments in my subcommittee bill in jeopardy because one other amendment is being pushed, and they are going to take all of them out. So it is great fun.

The next witness this afternoon is a longtime good friend of mine, Mr. Jim Grahl. He is the manager of Basin Electric Power Co-Op from Bismarck, N. Dak. Jim has a reputation of being a no-nonsense construction man, and he has built some of the most efficient and attractive mine-mouth generating plants in the world, and I am glad that he took the time to come down and testify in this series of hearings that we are having.

Welcome to the subcommittee, Jim.

STATEMENT OF JAMES L. GRAHL, MANAGER, BASIN ELECTRIC POWER CO-OP, INC.

Mr. **Grahl**. Thank you, Senator.

Mr. Chairman, as you mentioned, I am general manager of Basin Electric Power Cooperative, which is headquartered in Bismarck, N. Dak., and it is the principal wholesale power supplier for about 120 rural electric systems in 8 States of the Missouri River Basin. [Exhibit 1.] [1]

These systems encompass a combined service area of more than 400,000 square miles and provide electric service for more than 300,000 farms, ranches, and rural homes and businesses, or about 1 million people.

The region is, for the most part, sparsely populated, and there are less than two consumers for every mile of distribution line in the entire Basin Electric member service area. One member distribution co-op in South Dakota, for example, serves a total of less than 2,000 rural families scattered over an area larger than the combined States of Delaware, Rhode Island, Connecticut, half of New Jersey, and the District of Columbia.

Basin Electric was organized by its member cooperatives in 1961 as a supplemental supplier to develop an adequate and reliable source of electric power to meet the growing electrical needs of their rural consumers and to gain a measure of energy equity with nonrural consumers.

Continued growth in electricity requirements in the region is the result of economic expansion due to agricultural mechanization, the development of plants to process agricultural products, residential conversion for heating purposes from fossil fuels to electricity, and new growth from mining for energy production and oil development.

To supply this growth in requirements, Basin Electric has developed from a system with no generating capacity in 1962 to over 1.6 million kilowatts in 1982. During this period, agricultural production grew substantially, and much economic development took place in the region.

During most of the 1970's, the member system cooperatives continued to need more and more electricity from Basin Electric, reflecting an annual growth rate that would require a doubling of generating capacity every 7 years.

As a result primarily of the economic depression in agriculture and of energy conservation by consumers, Basin Electric's member load growth has become less than had been projected by our member systems in earlier years. However, our member requirements this past winter exceeded the previous maximum by 15 percent, and we continue to forecast a significant load growth in future years in excess of 4 percent annually. Basin Electric is contractually obligated to meet that growth in member power requirements, at whatever level it takes place.

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[1] See p. 87 for the exhibits presented by Mr. Grahl.

A major reason for this expected expansion is the Nation's increasing use of Western coal to provide a secure supply of energy, resulting in expansion of coal mining in the Fort Union coal fields and the Powder River Basin and a massive oil and gas exploration program in the Williston Basin.

For example, between 1977 and 1981, one member cooperative which serves in western North Dakota—that is, McKenzie Electric—experienced an increase in load growth of almost 400 percent, with most of the increase resulting from oil and gas development. [Exhibit 3.]

An example of forecasted future increases in requirements is a study recently conducted in Nebraska predicting a growth in demand from 14 billion kilowatt-hours in 1980 to more than 34 billion kilowatt-hours in 1990.

Irrigation is anticipated to lead the growth during that period. The number of electrically driven irrigation pumps, which numbered almost 23,000 in 1980, is projected to climb to more than 74,000 by 1990. [Exhibit 3.] This demand for additional electricity will have to be met in large part by rural electric co-op systems, some of which receive their wholesale power from Basin Electric.

The ability to meet this demand adequately, reliably and within a reasonable cost is jeopardized by the ever higher construction costs for new powerplants and transmission lines and the ever higher cost of financing such construction. It is yesterday's inflation now being financed at unprecedented interest rate levels—rates which are built into the repayment schedules for the next 35 years. In fact, in 1984 we estimate that over one-half of Basin Electric's wholesale power cost will be interest expense. That is a total of $195 million in that 1 year for interest.

The impact on an already hardpressed agricultural producer is devastating. For example, the average farm consumer in our area requires at least 2 kilowatts of electric generating capacity per month, which provides about 900 kilowatt-hours of electric energy, and actually many agricultural producers use several times that much.

In 1976 that amount of electricity cost that farm consumer about $16.50 per year for interest and depreciation. By 1985, that same amount of electricity produced from new generating facilities will cost about $274, a seventeenfold increase for just interest and depreciation.

The difference is this: Basic Electric's Leland Olds Station Unit No. 2, completed in 1975, was constructed at a cost of $270 per kilowatt of installed capacity, and financed at an average interest rate of 3 percent and depreciated at 3.1 percent annually.

In comparison, a new generating station to be completed in 1985 will cost approximately $1,600 per kilowatt and will be financed at an interest rate now estimated at 14 percent.

The ability of rural electric cooperatives to borrow sufficient funds within a reasonable time period under the guidelines of the Rural Electrification Act is essential to maintain adequate and reliable electric service. At the same time, the ability of wholesale power supply cooperatives to have access to long term guaranteed financing through the Federal Finance Bank is imperative if power supply obligations are to be met in the future at prices that consumers can afford.

Our capabilities are of importance to other consumers, as well. The Antelope Valley Station now under construction by Basin Electric near Beulah, N. Dak., includes capacity to be financed and owned by an investor-owned utility, Montana-Dakota Utilities, also headquartered in Bismarck, which serves urban consumers in North and South Dakota, Montana, and Wyoming.

Furthermore, the Antelope Valley Station will also provide 70,000 to 90,000 kilowatts of electric power for the Nation's first commercial coal gasification facility now under construction adjacent to the generating station.

The siting of coal fired generating plants has become a fragmented, complex and speculative undertaking, resulting in greatly increased cost and an inability to plan for future power supply capacity in an orderly manner.

Federal, State, and local law and regulations promulgated during the 1970's have elevated environmental considerations over economic considerations as the largest single factor in power supply planning. A myriad of considerations, many of them ambiguous, must be taken into account while responding to diverse regulatory requirements and public interest groups.

A power supply project that is started within the next couple of years may require more than 80 different Federal, State, and local permits, most of them not correlated or coordinated with one another and usually administered by separate agencies.

The process for developing coal fired powerplants now takes 10 to 12 years from the time the need is determined until the new capacity is actually available to the consumer.

Attached to my testimony is a listing of the various Federal acts and laws which affect this planning process, the list of the Federal, State, and local permits required for the construction of the Antelope Valley Station, together with a leadtime chart reflecting the impact on future planning. (Exhibits 4, 5, and 6).

Some provisions of the Federal Clean Air Act, as presently written, have created serious uncertainty over Basin Electric's ability to develop any additional power supply capacity at a reasonable cost in the State of North Dakota.

While we believe that Basin Electric and its member rural cooperatives have demonstrated an unusual degree of concern for the environment, certain provisions of the Clean Air Act not only do not allow for that kind of considered approach, but may preclude further development altogether. (Exhibit 7.) That section of the act which needs to be modified, the prevention of significant deterioration section, is unrelated to the maintenance of public health and welfare standards, which are provided for by other provisions of the act.

What is specifically required is a change from 3 hour and 24 hour sulfur dioxide increment measurements to annual increment measurements as they relate to class I area air restrictions.

Overregulation, high construction costs and excessive interest rates which have discouraged the development in many parts of the country of adequate power supply capacity which will be needed in the future adversely impact the entire energy industry and no part of it more so than the Nation's rural electric cooperatives.

The need for electric power capacity will be more acute in the event of another oil shortage. This Nation, including rural America, has suffered enough from the results of the 1973 embargo. If our abundant coal supplies are underdeveloped, our rural electric consumers, the Nation's agricultural producers, could find themselves not only short of the necessary oil products, but also short of the electric power required for food production.

At the present time there is surplus electric capacity in the upper Midwest, as there is in other parts of the country. But with a revitalized national economy, including higher farm prices, that surplus situation could be diminished rather quickly. We know of only two additional generating units in the planning stage in our region, which is a very large region in the middle of the country, which are to be completed and available between 1985–90.

One of these two is Basin Electric's proposed third unit of the Antelope Valley Station for which we have been unable, to date, to obtain an air quality permit. The present schedule for permitting construction means that this unit cannot possibly be on the line before November 1989, if we do get the permit.

This indicates how difficult it would be for Basin Electric and other power suppliers to respond with any immediacy to new circumstances involving increased electrical demand.

Food, fiber, and energy production require long term commitments by Basin Electric and the rural electric cooperatives if the Nation is to continue to have adequate supplies of food and energy.

I would like to commend you, Mr. Chairman, for taking time now when the situation is favorable and there is no immediate shortage of fuel, food, or energy to review the rural electric power supply situation and the need for rural energy equity. The situation could be completely different in the next few years, and it is those eventualities for which we all need to be prepared.

Senator ANDREWS. Thank you very much, Jim, for a very concise and straight-forward statement, as always.

I think that your exhibits Nos. 4, 5, and 6 spell out in a real forceful way what has happened with the number of permits we have today to put together a plant, and without objection I will have them included in the record because we often hear about permits, but not only your listing of the permits that have to be asked for, but the chronological way you went through it on the Antelope Valley Station, which is not finished yet, and then the bar graph at the end, I think can show consumers across this country why we have got the problems we have got.

In your testimony you observed that it now takes from 10 to 12 years to construct a generating station. How long did it take to plan and construct Leland Olds No. 2?

Mr. **Grahl**. Well, that took about 7 years, and prior to that——

Senator **Andrews**. What about the first one?

Mr. **Grahl**. The first one took 4 years. Basin Electric got the loan for the unit in the spring of 1962 and by January of 1966 the unit was in commercial operation.

Senator **Andrews**. And it was what size plant?

Mr. **Grahl**. It was a 216-megawatt unit, sir.

Senator **Andrews**. And now you are building them at what size?

Mr. **Grahl**. A little more than twice that size, 500 to 600 megawatts.

Senator **Andrews**. But certainly a 216-megawatt unit is no teakettle.

Mr. **Grahl**. No. At that time, that was the largest lignite-fired unit in the country.

Senator **Andrews**. If not the world. What about South Africa?

Mr. **Grahl**. There were some other lignite-fired units, but I cannot remember now the exact sizes.

Senator **Andrews**. Well, in other words, it was the biggest one in the Nation.

Mr. **Grahl**. Yes.

Senator **Andrews**. You mentioned in the list that I have included in the record the largest number of laws that inspired these regulations that required over, I think, when I looked at it, some 80 permits so far to move ahead with the Antelope Valley Station.

How many permits did you have to go through to construct your first plant?

Mr. **Grahl**. About six.

Senator **Andrews**. And now you are in excess of 80?

Mr. **Grahl**. Well, for the third unit of the Antelope Valley Station, we think we will need 80 or more. For the first 2 units we needed about 60, and these are Federal, State, and local.

Senator **Andrews**. Are these 80-odd permits that you need necessary, in your mind, to protect the public health and welfare? I feel freer asking you that question because I know what an environmentalist you are and how you are concerned for the public health and welfare. Everyone in North Dakota is aware of that.

But do you think this many permits are really necessary?

Mr. **Grahl**. Well, I know the number could be reduced and the proceedings could be consolidated at a considerable savings in time and money for the consumers. The time required now for getting permits and for getting ready to start construction is far longer time than it takes to build the plant, and all during those years, one is paying interest on those expenses, these days at about 14 percent, and all that gets capitalized and it all enters into the cost of power.

I think we could protect the environment—we do now—with far less cost if there was some way of consolidating these permitting processes.

Senator **Andrews**. How does complying with these regulations and obtaining these permits increase construction costs and, probably even more important, wholesale power rates? What percent of wholesale power rates is attributable to this multitude?

Mr. GRAHL. I do not think there is an exact figure, but the estimate is that to protect the environment requires about 30 percent of the total investment.

Senator ANDREWS. No, I do not think any of us are objecting to protecting the environment.

Mr. GRAHL. Right.

Senator ANDREWS. It is the paper shuffling that has to be done. Your first plant, and I have been there, protects the environment.

Mr. GRAHL. Yes.

Senator ANDREWS. I think just as well as your latest plant protects the environment.

Mr. GRAHL. Just about.

Senator ANDREWS. But you did not shuffle near as many papers.

Mr. GRAHL. Yes.

Senator ANDREWS. Now, what percent of construction cost was taken up in these permits, filling them out and going through all of the rigmarole in the last plant you built or the one you are building now? What percent of the gross cost of the plant is attributable to this paper shuffling?

Mr. GRAHL. We have really not been able to come up with a percentage or a dollar cost, but it was very substantial. For example, to prepare an environmental impact statement now takes anywhere from 1½ to 3 years, and it costs about $2 million for a sizable generating station. I suppose we have a couple of dozen people on our staff to handle the very specific, direct paperwork involved in the permitting processes, but then there are a lot of additional engineering and other staff who are involved from time to time.

With respect to Laramie River Station, as you know, Senator, we not only went through some very extensive permitting and hearing processes, but we were then delayed by lawsuits filed against the REA Administrator and Corps of Engineers and the upshot of those lawsuits was that the plant came within 3 hours of being shut down after we had invested a half a billion dollars in construction, and we negotiated a settlement out of court at a cost, the ultimate magnitude of which we do not yet know. We had to agree to some provisions the cost of which are yet to emerge, but we had to agree to limit our water consumption to the point where it affects the cost of our plant operation, but these costs are impossible to evaluate in any precise way.

I just know that it is in the end unduly expensive.

Senator ANDREWS. Because the protestors felt somehow or other than running that water through the cooling tower and returning it to the river 2° warmer than you took it from the river would somehow or other damage it in its travel downstream?

Mr. GRAHL. That was one of the objections.

Senator ANDREWS. That was the famous whooping crane. Wasn't this the plant that the whoopers fly over the river 150 miles downstream from where the plant is and they made the case that somehow or other looking down—they do not nest in the area. As I understand it, they just fly over that stream 100-and-some-odd miles east of your plant, and looking down it was felt by the environmentalists that the whoopers would be discombobulated by the fact that 1 or 2 percent of that water in the stream when they flew over it had been through a cooling tower, so you paid what, $7 million for that whooping crane problem?

Mr. GRAHL. We set up a $7.5 million trust fund.

Senator ANDREWS. Paid by the consumers of electricity in the upper Midwest.

Mr. GRAHL. The crane habitat was 285 miles downstream, and for the past 2 years there have been no confirmed sitings of whooping cranes in that habitat area.

Senator ANDREWS. No; but in case they should fly over and look down, the fact that 1 or 2 percent of that water had at one time been close to your cooling towers—285 miles upstream?

Mr. GRAHL. Yes.

Senator ANDREWS. Might affect their disposition in some harmful way, it would be claimed.

Mr. GRAHL. Well, actually it was a judicial finding and it seems to me it poses a very serious problem, because the judge found against us because we could not insure that the plant would have no adverse effect on the habitat of whooping cranes, and I have no idea how one could prove something like that.

Well, the only way that we got the plant built was to agree to a settlement and, through the help of a lot of people, including yourself, sir, an amendment to the Endangered Species Act to get a special dispensation from a Cabinet committee to proceed with the project. But the most expensive part of the settlement was that we may have to replace as much as 11,250 feet of water in the North Platte River each year and it turns out that, if we have to do that, it may cost a great deal more than the trust fund.

Senator ANDREWS. Do you use that much water in your cooling?

Mr. GRAHL. We use more than that. The trust fund was set up in lieu of replacing even more water.

Senator ANDREWS. Do you evaporate 11,000 acre-feet of water?

Mr. GRAHL. We are allowed to evaporate 23,250 acre-feet. Now, this is for three generating units at 550 megawatts each. So, it is a very large powerstation.

Senator ANDREWS. It is not taking the water in any different form than it would be taken for irrigation. There is no pollution if you add an acre-foot per acre in that area. So, that is about the same as 23,000 acres of irrigated farmland to provide energy to all that area.

Mr. GRAHL. We figure about 1½ acre-feet per acre.

Senator ANDREWS. It is about 17,000 acres worth of irrigated land?

Mr. GRAHL. Yes; but this is water that was not being used for irrigation. This was unappropriated water.

Senator ANDREWS. The State has no objection to your appropriating that water. Your use was the best use that could be made of it.

Mr. GRAHL. That is correct. Objections were raised by the State of Nebraska and the National Wildlife Federation and the Audubon Society, and also two Wyoming environmental organizations.

Senator ANDREWS. Does the State of Nebraska get any power out of this plant?

Mr. GRAHL. Yes, sir. They get a substantial amount of power.

Senator ANDREWS. But they objected to the building of the plant before they knew they would get energy from the plant?

Mr. **Grahl**. The attorney general said he did not object to building the plant. He just did not want us to use any water.

Senator **Andrews**. That is an interesting thing. I suppose you do that with mirrors.

Finally, I am concerned over some of the rural electric co-ops in getting quick action on their loan applications, particularly in the area of western North Dakota, which you serve so well, and eastern Montana where we have the enormous energy developments that are being called upon, as you pointed out in your testimony, to supply more and more electricity for oil drilling and pumping activities.

Are they getting the financing they need in order to provide for the substantial growth and demand to protect domestic energy interests?

Mr. **Grahl**. As far as we can tell, they are not. We are not directly involved, but we are concerned about the situation because the rapid growth in oil pumping loads has put a heavy burden on the existing transmission systems, and within the past 6 months our engineers have run computer studies that indicate that as of this coming winter, next winter, if any one line has an outage, the whole system in western North Dakota may collapse.

The REA has so far told the cooperatives to go to the oil companies for their financing and the necessary transmission lines. This is my understanding.

I am not directly involved, but I gather at least some of the oil companies have not been too eager to put up the financing for the co-op transmission lines.

Senator **Andrews**. Thank you very much. I appreciate your coming today. You have made a most interesting presentation today. Thank you very much.

Our next witness is Mr. Sherwood Smith, chairman of the board, American Nuclear Energy Council.

You are a friend of a friend of mine.

Mr. **Smith**. I have to plead guilty as charged, and I plead for mercy.

Senator **Andrews**. My daughter is in his law firm.

You are welcome to the subcommittee, and you may proceed with your testimony. I will assure you, as I have other witnesses, that your testimony will appear in the record in full as though read in its entirety, and if you want to summarize it to save more time, that is strictly up to you.

STATEMENT OF SHERWOOD H. SMITH, JR., CHAIRMAN OF THE BOARD, AMERICAN NUCLEAR ENERGY COUNCIL

Mr. **Smith**. Senator, I appreciate the opportunity to summarize it, and I have filed a copy, and of course, if there are any questions I would be glad to respond to any questions after I go over it.[1]

Senator **Andrews**. Well, do not worry. We will have some questions.

Mr. **Smith**. Fine. Well, may I begin?

Senator **Andrews**. Please begin.

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[1] See p. 96 for the prepared statement of Mr. Smith.

Mr. SMITH. As indicated, I am chairman of the board and president of Carolina Power and Light Co. We are headquartered in Raleigh, N.C. We serve about one-half the State of North Carolina and one-fourth the State of South Carolina. It is an area of about 30,000 square miles, with a population of some 3 million people.

The area is largely rural in nature, although industry has begun to develop over the last 20 years and is bringing about a balanced and well diversified economy.

We do serve 18 rural electric cooperatives with whom we are negotiating an arrangement through the North Carolina Electric Membership Corp. for the joint ownership of both nuclear and coal-fired facilities.

Senator ANDREWS. I am sure you know the senior Senator from North Carolina who is the most distinguished Chairman of this committee on which I serve.

Mr. SMITH. I certainly do know him, yes.

Senator ANDREWS. He thinks you run a good operation down there.

Mr. SMITH. Well, you are kind to say that.

Senator ANDREWS. He told me to say kind words on your head when you are here.

Mr. SMITH. I appreciate that. That is not often the case for an electric utility executive these days.

Senator ANDREWS. Well, that is true, but you must be a cut above most of them.

Mr. SMITH. Our company built the first nuclear plant in the Southeast. It was brought into service in 1971. It has operated very well in the past 11 years and served our customers well over $300 million in fuel cost savings, which is about 2.5 times the cost of the plant itself. We also built the first nuclear powerplant in North Carolina, a two unit plant, that is located on the southeast coast. One of the units came in in 1975 and one in 1977.

In addition to representing my own company, as was indicated, I am testifying on behalf of the American Nuclear Energy Council of which I am chairman. ANEC, as it is called, represents more than 100 organizations, all involved in the production of electricity through nuclear power.

As has been stated earlier by other witnesses, including in particular the witness immediately preceding me, there have been tremendous costs in the generation of electric power which have been imposed upon the utilities, both public and private, recently, because of many governmental requirements. I am speaking of delays in the licensing of nuclear powerplants, unnecessary requirements with respect to the construction of those plants, unnecessary requirements with respect to compliance with clean air and clean water standards. All of these have had a tremendous impact upon the cost of producing electric power in this country. It is the customers of the systems who bear those costs and who ultimately pay those higher costs of generating electricity.

In the oil embargo era that began in 1975, we saw a slow down in the rate of growth of electricity in this country from the average rate of growth over the past 5 years before 1973. The rate of growth before 1973 was about 7.3 percent. It is considerably lower than that today. In our own part of the country, we are experiencing a rate of growth of about 3 percent.

With the reduced rate of growth, it has been possible for many systems to accommodate somewhat to the higher costs by either canceling the construction of facilities or deferring the in-service date of those facilities. More and more recently, the reasons for the deferrals and the cancellations are not lower rates of growth, but the reasons are the financial inability of those systems to pay the higher costs of construction for both nuclear and coal fired capacity.

Senator ANDREWS. Well, how do you compare your statement of slower rates of growth to the testimony of the first witness from California who pointed out that we could have sharply rising rates of growth in electric consumption, if we use it as a substitute for imported oil to heat our homes and do a host of other things?

Mr. SMITH. Yes, that is correct. I heard Mr. Balzhiser's testimony, and I agreed with it. When I said we are experiencing today a lower rate of growth, I was comparing the current rate of growth with the rate of growth that the country was experiencing before the 1973 OPEC oil embargo.

But as one looks at the rate of growth in all energy consumption today, the growth rate of electricity is still running ahead of the growth rate of total energy. So I would say that as we look out to the future that what one might expect, for many of the reasons Mr. Balzhiser stated, would be that we would have a steady acceleration in the rate of growth in the use of electricity from the point where we are today. I think that the substitution which he discussed is one of the reasons for it. Certainly, as the economy begins to expand, there is a tremendous amount of underused industrial capacity in the country today, and as we begin to reduce unemployment and utilize that capacity, then the rate of growth in electricity is expected to pick up rapidly.

One of the principal concerns that I have and that many of us in the industry, both public and private, have is that as we continue to see many of these deferrals and cancellations of large plants, both coal and nuclear, we are getting to the point where we are likely to have a shortfall in electric generating capacity in the late 1980's and early 1990's.

I think that even with the best results from conservation and load management, which everyone would endorse and applaud, the shortfall in electricity is going to come to this country. At the time when we perceive that the shortfall is at hand, it is going to be much too late then either to revive units whose construction was planned but canceled, or to plan new units.

I think one of the objectives of planning an adequate electric supply in this country has to deal with this question of whether or not it is going to be possible to reduce the cost of building new facilities; so that it will not be necessary for the systems to raise quite as much capital. Then, what can be done to make it possible for the electric systems, public and private, to raise the additional capital on reasonable terms in order to build a minimum amount of new facilities needed to avoid this shortfall which we see as a great potential danger in the future.

In our own case, that means, first of all, it will be necessary to charge higher electric rates in the short run, and that is not a very pleasant message to deliver to the public. But, unless the public is willing to accept the concept of somewhat higher rates in the short run in order to have adequate supplies of power and ultimately much lower rates in the long run, then in the investor owned industry we are not going to be able to bring in the necessary new capital. I am sure the same is true to a great extent in the public sector.

There is going to have to be an acknowledgement that we will have to pay more than one would like to pay for electricity in order to assure ourselves of an adequate supply. The way in which we can hold down those costs and prevent the public from paying more than is absolutely necessary is by completing as many of the plants now under construction as possible.

It is terribly expensive to cancel these plants and then face the replacement of that capacity later on with much higher cost capacity. If it is possible to reduce unnecessary regulatory requirements, we can build a nuclear powerplant perhaps in 8 years instead of 14 or longer, and we can build a coal-fired plant perhaps in 6 to 7 years instead of 8 to 10 years. The Nuclear Regulatory Commission has a role in this. Certainly the Environmental Protection Agency has a role to play in this. The many, many State and local permitting agencies have a role to play in this.

I think the Congress certainly can set the tone for the entire country with respect to the Federal agencies that are involved. The principal Federal agencies involved are the EPA and the NRC in terms of the costs of construction of these plants.

Where it is possible still to build dams and construct new hydroelectric facilities, the extent that the Federal Energy Regulatory Commission can expedite the licensing, that would be of some help.

The policy of this country has been to recognize the need to provide assistance because of the differential in cost between serving rural areas and urban areas, as was addressed by a previous speaker. We should continue a reasonable REA funding program in keeping with the objective of balancing the budget and not taking on more direct Federal expenditure responsibilities. I think there is room to do both and to continue to provide for a reasonable amount of REA funding, or REA-supported funding, particularly where there are large projects involved that require a long period of time to complete.

I have been somewhat concerned with reports that are appearing in the media about reduced REA-supported funding for nuclear projects because they are more expensive and take a longer period of time to construct. Because of these characteristics, however that is exactly the type of support by the Government which is needed in order to make these jointly and to complete them on a timely basis.

I would pause now, having submitted my written testimony, and be pleased to respond to any questions that you might have.

Senator ANDREWS. Well, thank you very much. In your testimony you indicate that there have been no new nuclear reactor orders in the past 5 years. You go on to say none may occur in this country within the next several years.

In your judgment, after this hiatus, do you feel there is likely to be a resurgence of nuclear orders in the future?

Mr. SMITH. I think, the need for additional supplies of coal-fired and nuclear generation will certainly be there. There will be a need for new capacity to come in in the nineties. Whether that capacity can be nuclear or not, is up to the U.S. Congress and up to the Federal agencies.

If, indeed, it is possible to develop a sense of certainty at the NRC so that when you plan a plant you know what it is you will be required to build and, therefore, you can come to some reasonable estimate of the cost; if, indeed, it is possible to shorten the licensing time, which means shortening the construction time and drastically reducing the cost of building nuclear plants; and if Congress proceeds to enact legislation this year dealing with the handling of spent nuclear fuel and the ultimate disposal of high level wastes; then I think it is quite likely that new orders of nuclear generating units will be seen.

Studies that have been done by many systems around the country have shown time after time that when you apply any sort of reasonable escalation factor to the price of coal, 7, 8, 9 percent, over the life of a plant, nuclear is likely to be cheaper after about the fifth or sixth year even under the current conditions of much higher nuclear initial capital costs.

So I would say that whether or not there will be new nuclear units ordered depends, to a large extent, on what the U.S. Congress and Federal agencies between now and 1985 or 1986.

Senator ANDREWS. Will the nuclear manufacturing industry retain the capability for several years to come to fill future new orders down the line, or will they become an extinct industry?

Let me relate that question to this statement. It is going to be tough as a farmer to go in and order a combine if International Harvester and John Deere both bite the dust.

Mr. SMITH. You have a very important question. The four major companies, that is—Combustion Engineering, B. & W., Westinghouse, GE—have all announced that they are, because of market conditions largely, constricting and reducing their capability of supplying nuclear steam supplies in the future.

I think that many of those four are looking to the foreign export market potential as a way in which to maintain a minimum amount of sales to bridge the period of time between now and when it might be expected that you would order new reactors in this country. This involves the Federal Government, as well. The policies of the Federal Government in respect to the Export-Import Bank financing, and other things to make our manufacturers competitive are tremendously important.

Senator ANDREWS. Are they able to stay competitive in the international field?

Mr. SMITH. I believe that you would find they are. For instance, General Electric Co. has just completed the construction of a large nuclear plant in Taiwan. It was built in 6 years from start to finish. This plant was originally ordered in a competitive situation. I believe that our manufacturers, given the same level of Government support that other foreign countries have that they would be competitive.

Senator **Andrews**. You are talking about Government support. What do you mean by Government support? Do you mean capital?

Mr. **Smith**. The Federal Export-Import Bank financing.

Senator **Andrews**. I assume you are talking about the Government support that the nuclear generating industry is getting in other countries, which is why it is able to move ahead there and really take over an increasing share of the generating capacity. As I understand it, France is going to be generating 60 percent or so of their electric power in another decade.

Mr. **Smith**. It will be a very large percentage of their nuclear power. I think they are to be commended for having taken the technology that we gave them under the Eisenhower "atoms for peace" program and moving forward with it very rapidly, and more rapidly.

Senator **Andrews**. Is it just technology or, since this is a Senate subcommittee, is the Government of France doing something to enhance the building of these nuclear plants that our Government should be doing, or is it just that the people over there are realizing that it is one of the long range, low cost, best ways of generating electricity?

Mr. **Smith**. Well, with respect to the French nuclear program, I think that the Government there made the decision about the time of the OPEC oil embargo in late 1973 that because they had no indigenous supplies of oil and gas, and limited supplies of coal, that it was in their national interest to move ahead very rapidly and aggressively with construction of a large number of nuclear powerplants. France is a smaller country, very centralized direction and highly controlled through the central government. This was the implementation of government policy that in a country which did not have the same variety of fuel options that we have.

Senator **Andrews**. How do they subsidize it or do they subsidize it? Do they provide grant money to the plants? Do they provide low interest loan money to the plants?

Mr. **Smith**. Well, I could not speak to the exact financing, but the plants are owned by EDF, Electricité de France, which is the government-owned electric utility system. It differs from our systems.

Senator **Andrews**. They just tell them to go build it and they do.

Mr. **Smith**. Well, they provide the financing for them. The Government provides the financing for it. You have the privately owned systems in Western Germany still, and there their financing is somewhat similar to ours. It is basically bank financing on a longer term than one would expect to find bank financing here.

But to answer the other question as to whether or not our manufacturers can remain viable, I think that yes, they can remain viable if we will take steps that will make it possible to complete the nuclear units that are now under construction, and if we will make it possible to build those plants with a minimum of new restrictions and requirements from the NRC.

Many things are done in the name of safety which are counterproductive, and I think that some realism needs to be brought to the NRC licensing process, but I am optimistic. I think that is happening now.

I think the Commission over the last 12 months has seen a dramatic change in focus. I would have to commend the current Chairman of the NRC for the direction in which he has stated he expects the NRC to move, so I am optimistic with respect to the possibilities here.

It is not easy to be optimistic in this business, but I tend to be much of the time.

Senator **Andrews**. Sometimes I wonder about the industry canceling or slowing down the building of plants—whether they are doing it because they believe these slow growth rate trends or because financing is difficult to get right now, so they are leaning on the slow growth trend lines as an excuse not to go ahead.

Mr. **Smith**. Well, it is obviously a combination of factors. I think that initially as the cancellations began, the dominant reason probably was the tremendously reduced rate of growth. More and more I think the dominant reason is financial, that the utility systems simply are not able to raise sufficient money to complete these projects that they have under construction.

Senator **Andrews**. In your testimony you say, and I read it with a great deal of care, we in the electric energy business must do more to build public understanding about why rates must increase and why an adequate supply of electricity is a basic requirement for economic growth, job creation, improved productivity and national security.

That is one of those beautiful lines that makes me wonder what are you doing in Carolina Power & Light to achieve that end.

Mr. **Smith**. I think I can address it from the standpoint of what our company is doing and then what many systems on an industrywide basis are seeking to do.

It is a requirement of every individual in our organization, and there are about 7,500, that even though their job description might not have a written statement that says public communications is expected of them, that they are expected to be able to talk with their friends and neighbors and others about why the cost of producing electricity has gone up and why we, as one company, will have to recover our costs if we can continue to provide electric service in the future.

We have a great deal of talent, I think, in the corporate communications part of our organization. As a chief executive officer of the company, I believe it is essential that I take a leadership role, and in a city the size of Raleigh, N.C., which is about 150,000 people, it is impossible for me to spend 1 day without talking about electricity, the adequacy of supply, the cost of it. It is something that I take very, very seriously, and I look for opportunities to discuss it.

On a national basis, the Edison Electric Institute has sought to mount a campaign that would help to do some of the things that I stated in my testimony.

With respect to nuclear, where perhaps the greatest need for expanded improved public communications exists, we have organized the U.S. Committee for Energy Awareness with a board of directors of 10 electric utility chief executives, a manufacturer, the head of a large architect and engineering firm, the head of a large aluminum manufacturing firm, and the head of a uranium mining company. We have encouraged the participation of the public systems in our planned programs.

It is our plan to mount a very aggressive, and it will be a costly, campaign to better inform the American public about the benefits of nuclear power. Today, we produce more electricity using nuclear power than we do using oil. By the end of this year we would expect to produce more electricity than we produce by gas as well as oil. Soon we would expect to produce more electricity by nuclear power than either gas or oil or hydroelectric.

Nuclear power is an essential part of this country's whole framework. Unless the people understand that, they will not take the steps that are necessary to protect their interests in the continued development and utilization of nuclear power. We have, today I think, a small minority of the country frustrating the best interests of the majority of the country.

Senator ANDREWS. Well, let's hope you get that job done.

Mr. SMITH. Thank you.

Senator ANDREWS. Thank you for coming here today.

Mr. SMITH. Senator, thank you very much.

Senator ANDREWS. Our next witness is Mr. A. Denny Ellerman, who is the executive vice president of the National Coal Association.

Welcome to the subcommittee, Mr. Ellerman. We appreciate your taking the time to testify, and let me assure you as I have the others who have come today that your full statement will appear as if read in its entirety, and you can summarize it in any way you want.[1]

STATEMENT OF A. DENNY ELLERMAN, EXECUTIVE VICE PRESIDENT, NATIONAL COAL ASSOCIATION

Mr. ELLERMAN. Thank you very much, Mr. Chairman.

NCA's president, Carl Bagge, asked me to express his regrets that a longstanding commitment that prevents him from being here. I would like simply to highlight some of the points made in the full testimony which has been submitted for the record.

The spirit of my remarks is captured in a statement by William Jennings Bryan more than 90 years ago in which he said, "Burn down your cities and leave your farms, and your cities will spring up again as if by magic. But destroy our farms and grass will grow in the streets of every city of the country."

Mr. Chairman, the coal industry believes, as did the silver-tongued orator, that the policies which serve rural America are the same policies which serve all Americans. Assuring an ample supply of energy at reasonable costs through the increasing use of coal is a policy in point.

There are two ways in which coal can serve rural Americans. First, it provides cheap and reliable source of energy for the generation of electricity, which is extremely important, of course, not only for the farm home, but increasingly farm operations as well.

Secondly, coal can help to insure adequate supplies of the petroleum products and natural gas that are crucial to farm operations and improved productivity by replacing oil and natural gas where those fuels are used to generate electricity.

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[1] See p. 99 for the prepared statement of Mr. Ellerman.

Coal's ability to help rural America, both directly by providing cheap electricity and indirectly by insuring adequate supplies of petroleum products and natural gas, is, however, contingent on maintaining coal's present and prospective cost advantage compared to oil and natural gas.

The coal industry is doing its part here. Over the past 10 years there have been huge investments in new mines and in building up the skills of the work force, and as a result productivity has increased.

Also, the huge cost of regulation to make mines safer and healthier places to work and to promote a wide range of environmental values are now a part of today's coal prices.

However, the industry's efforts are not enough. The price of coal and its competitive advantage is equally affected by policies adopted at the national level. I would like to identify some of these polices. They are crucial to the long term success of building a reasonable and workable energy policy serving rural and urban Americans, alike.

These policies comprise four elements. First, avoiding unnecessary and burdensome regulatory costs or, in a word, overregulation.

Two, the further deregulation of natural gas prices.

Three, more competition in the transportation of coal.

And, four, ready access to the Nation's abundant coal reserves.

I would like to elaborate on two of these points. To recite the coal industry's problems with overregulation would exhaust the committee's patience. So let me offer a case in point: acid rain legislation that is presently under consideration by this Congress.

I will not burden you with the particulars of the acid rain debate. Suffice it to say that one bill in the Senate seeks to impose a 50-percent reduction in sulfur dioxide emissions from 31 States east of the Mississippi River, primarily affecting 10 Midwestern States. These reductions would be mandated based upon a plausible, but as yet wholly unproved, theory concerning the causes and effects of acid precipitation.

According to the Department of Energy, this legislation would cost consumers dearly, as much as $300 billion over the next 30 years. What is more, there is no assurance that the proposed controls and the large amounts of dollars spent would have the slightest effect on the acidity of the rainfall.

Faced with these realities, it is prudent to accelerate acid rain research, not embark on a new, costly regulatory effort which offers little assurance of success.

With respect to the transportation sector, the Staggers Rail Act that was enacted in 1980, and which I am sure you remember well from your time in the House, was the necessary first step to insuring a viable network for the transportation of coal. Bankrupt railroads will carry no coal.

For this reason, the NCA strongly supported enactment of the Staggers Rail Act. But the second step has yet to be taken, and that is to enhance the competition whose absence is the only argument for regulation in the first place.

Two measures now before this Congress would go a long way to enhancing competition for the transportation of coal, and consequently keeping coal rates and delivered coal prices reasonable. These are legislation to grant Federal imminent domain to coal slurry pipelines and proposals to effect the needed improvements in our inland waterway transportation system.

We recognize legitimate concerns that you, Mr. Chairman, and other Senators have about Western water and the impact coal pipelines might have; but we believe the coal pipeline legislation, as drafted, actually strengthens State prerogatives regarding the use of water by granting to each State considerably more protection to control allocation of water resources than they presently have.

Waterways are moving coal and other commodities at low cost. However, maintenance has been neglected. New locks and dams are also needed to maintain the waterways' competitive advantage with respect to the railroads. These measures require, in turn, that we find the ways to finance such maintenance and improvements and to reduce the redtape and delay that is normally encountered in the planning and construction of these projects.

Competition is a central issue with respect both to slurry pipelines and inland waterway projects. It is not a question of whether the railroads are capable of hauling the increasing coal traffic. It is a question of protecting captive shippers and consumers from rate increases when there is no competition for the transportation of these commodities.

In conclusion, Mr. Chairman, allow me to reemphasize the coal industry's agreement with William Jennings Bryan's observation that what serves the interests of the farmer also serves the interest of all Americans. In energy, rural America is best served by policies which avoid artificially inflated energy costs and which insure adequate energy supplies, especially of those fuels in comparatively short supply.

These are policies which are also preeminently in the national interest.

Mr. Chairman, I thank you for this opportunity to represent the American coal industry. I would be pleased to answer any questions you may have.

Senator ANDREWS. Thank you, Mr. Ellerman, for a most thoughtful statement.

I look at exports quite a bit. I think, as a matter of fact, our problem with the imbalance of payments is probably one of the big things that has caused our economic chaos in this Nation today. When we were importing $5 billion worth of oil in 1973 and exporting $5 billion worth of farm products, we were in balance. In fact, we stayed in balance until about 1978 when we were importing about $40 billion worth of oil and we were exporting $40 billion worth of farm products.

Then we plateaued out on the farm products' export line. The imports of oil kept going up and up to about $80 billion, and I think probably $70 billion now, but they were at $80 billion last year, and that gave us a $40 billion trade imbalance. For some strange reason—I think we all know the reasons for it—we are not exporting many automobiles, or steel, or motorcycles, or cameras and things like that.

As a result our economy suffers. Now, in your statement you mentioned the increase in American coal exports. In fact, you strongly urge that we step up these exports, and you pointed out that these current exports are adding billions of dollars to our balance of payments.

Can you provide the subcommittee the current level of exports?

Mr. ELLERMAN. Yes, I would be glad to do so.

Senator ANDREWS. Do you have them in the back of your mind approximately? [1]

Mr. ELLERMAN. The level last year was 110 million tons. That is a 50-percent increase over 2 years, for comparison. There has been quite an export boom in the past couple of years, as I am sure the Senator is aware. We have been delighted to join farm products as a major export commodity.

Senator ANDREWS. Thank you. What does it come out in dollar value per year?

Mr. ELLERMAN. The figure that sticks in my mind is $4 billion, but let me get back to you, Senator, on that.

Senator ANDREWS. Fine. Is that continuing to increase or is it falling back?

I remember reading an article a couple or 3 months ago where the human cry for more coal export facilities is now kind of backing away because that market does not seem to be there or we cannot supply it.

Mr. ELLERMAN. It has reached a plateau, I would say, what we regard as a temporary plateau. There has been quite a letdown of expectations, rather exuberant expectations, that existed a couple of years ago when it did not seem we could ship enough coal and could not start to meet all of the demand.

But that reflects both economic slowdown in Europe, the fact that a lot of the easy, first conversions have been made in Europe and Japan, and of course some hesitation given the fall in oil prices that have taken place over the past year.

It is important to note that coal exports have not declined. They have not fallen off. They have reached a level which is twice what they were a couple of years ago, and they are staying there currently under what must be considered less favorable economic conditions.

Senator ANDREWS. Then actually what you are doing is converting solid fuel into a liquid fuel. You are exporting the coal and facilitating the bringing in of the liquid fuel, the oil. We could do it in a synfuel plant here at home, but it is probably more efficient to swap, or is it?

Mr. ELLERMAN. Well, I am not sure whether it would be or not. At any rate, coal is substituting for oil in this country and reducing that demand. To the extent that it substitutes for oil overseas in Europe and Japan, lessens that demand and contributes to the price pressures that have forced oil prices down.

Senator ANDREWS. I think people ought to realize that there is a good deal of international consideration to be made in the field of fuel energy as well as food energy. I remember one time in Peking visiting with the Vice Premier. They have a number of Vice Premiers in China. We only have one Vice President. They have got about 12 Vice Premiers. They can pull one out of the wall for almost any subject they want to discuss or any group that they want to have spoken to. A Vice Premier can make his appearance.

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[1] See p. 105 for an expanded response by Mr. Ellerman.

But one I remember we were talking to, and I think it was one of the higher-ups in the hierarchy, was quite candid in what he said. I obviously was interested in their buying more wheat from us, and they have a great demand. A billion people could eat a whale of a lot of wheat. One more pound of pork a year for that many people is 100 million bushels of feed grain. If they eat another pound of pork a month, that is 200,000,000 bushels of feed grain. That is half our total wheat crop.

So the figures are intriguing, and he quite candidly said, "Oh, yes, Congressman." He said:

> No problem at all. We have an idea in the back of our minds. We are going to negotiate a long term fuel sales arrangement with the Japanese, and we are going to drill for our offshore oil using your rigs and the rigs of other Western nations and our people, and we are going to develop that oil, and we are going to keep our energy economy a coal economy. We then are going to export the oil to the Japanese who need it. We are going to swap that oil for their dollars, because they have got lots of your dollars, and then we will take those dollars and swap them for your wheat, and we therefore will have a way to pick it up.

So it typifies how tied up we are in the international world of trading before we could sell a bushel of wheat on the North Dakota farm. It is a great program. Unfortunately they have not moved ahead with their oil production as rapidly as they thought they could. So they have not had the exports to satisfy the contracts, which they did, in fact, negotiate with the Japanese, and that slowed them down a little bit from buying more wheat.

Mr. ELLERMAN. In respect to that grand strategy, they are moving ahead on the coal front. Recently one of the U.S. coal companies, the Island Creek Coal Co., signed a contract to help them in mining, to provide technical advice and so forth, which is of course a completely new endeavor for our industry.

Senator ANDREWS. And their farming, the way they look at things, they are a very labor-intensive country. I was on a farm 4 times the size of our own farm, raising essentially the same products. They had 72,000 employees. There were not as many weeds on them, but that's a whale of a lot of employees. Figuring the cost of the employee at $20 per month, the cost of their bushel of wheat was about $32. So they are swapping their oil for our wheat.

You say that Government policies must promote the greater use of our most abundant energy resource, which is coal. Do you believe candidly that we have strong and effective Federal policies that encourage the conversion from oil or gas to coal, that are, in fact, enhancing our switch to this most abundant of energy resources that we have here in this country?

Mr. ELLERMAN. I think the answer is the bucket is sort of half-full. Certainly with respect to our experience with conversion from oil to coal, nothing has so helped that as deregulation of oil prices, which of course started in the Carter administration and was completed in the present administration. That has done quite a lot to the conversion of utility units.

We have been disappointed with the reluctance of the administration to address the very complicated issues in natural gas deregulation. Everybody recognizes the problems that we face in 1984 with the expiration of price controls over a good segment of natural gas supplies. Our expectation is to the extent that those prices do reach a market price, whatever that may be (and I suspect personally it would be lower than what a lot of people fear) would permit a more judicious use of fuels in regions that are presently very heavily dependent on natural gas. These regions were dependent, rightly so, at a time when natural gas was very cheap, but that is no longer the case, or if so, only because of these price controls.

To the extent that coal is available and encouraged in that conversion through the deregulation of natural gas, gas supplies will be more available for other uses, such as on the farms where coal cannot be of direct help.

Senator ANDREWS. You expressed deep concerns about the effect of overregulation on supply, production, and pricing of energy. Can you cite for the committee those regulations that affect the coal industry that you feel are most unnecessary?[1]

Mr. ELLERMAN. There is a large number I could cite with respect to surface mining laws. We have an ongoing dialog in the regulatory process and in the courts with the Office of Surface Mining on a number of issues, and I would like to come back to you later with a list of the specifics. Many of them are very small, but in the cumulative, they add up quite a bit.

Overregulation affects not only the production side, but also the use side. I think several examples were given by Mr. Grahl. The type of problems he faces, and I think any utility faces, in trying to site and construct coal-fired powerplants. Abundant testimony has been given to that effect before you this afternoon.

Senator ANDREWS. Well, in your testimony you also mentioned the efforts to increase productivity in the mining of coal

Mr. ELLERMAN. Yes.

Senator ANDREWS. And everyone knows that increased productivity is necessary to reduce costs and control inflation or just to move to a different type of energy resource. How has productivity changed over the last 10 years in the coal industry? Have you been able to move toward a more productive way of mining coal and still safeguard the interests of the coal mining workers?

Mr. ELLERMAN. Productivity measured in the normal fashion over the past decade, which is the tons of coal mined per man in the mines, has been on a long term decline both in surface and underground operations. This decline has only reversed itself in the last 2 years, and is a source of great encouragement in the industry. We do seem to have turned the corner on productivity.

The causes are numerous; one of the principal ones, which is I think universally recognized as the cause for the decline over the past 10 years, has been the internalization of a number of these regulations and other requirements that have had to be met, many of them justified.

No one disputes, I believe, that the coal mines are safer places to work today than they were 10 years ago; that occupational diseases that are unique to the coal industry are more adequately dealt with today than they were 10 years ago. Those have all had their costs and have all resulted in decreases in productivity.

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[1] See p. 105 for an expanded response by Mr. Ellerman.

I think we can take encouragement in the trend in increased productivity over the last 2 years. Everyone knows that coal is dirty and is dangerous to mine, inevitably so, but the measures to assure the environmentally acceptable use of coal and to adequately provide health and safety for those who mine coal have been implemented and are fully incorporated in the price of coal today.

The second aspect that has contributed to turning this corner on productivity, has been the enormous investments in coal that have occurred since 1974. These investments are now bearing fruit. More efficient mines and new entrants into the coal industry that have also had a freshening effect.

Senator ANDREWS. Thank you for coming. I appreciate your contribution.

The subcommittee will stand in recess until 1:30 tomorrow afternoon.

[Whereupon, at 4:45 p.m., the subcommittee recessed, to reconvene at 1:30 p.m., May 26, 1982, in room 324, Russell Senate Office Building.]

OVERSIGHT ON RURAL ENERGY NEEDS

WEDNESDAY, MAY 26, 1982

U.S. Senate,
Subcommittee on Rural Development,
Oversight, and Investigations of the
Committee on Agriculture, Nutrition, and Forestry,
Washington, D.C.

The subcommittee convened, pursuant to notice, at 1:40 p.m., in room 324, Russell Senate Office Building, Hon. Mark Andrews (chairman of the subcommittee) presiding.

Present: Senator Andrews.

STATEMENT OF HON. MARK ANDREWS, A U.S. SENATOR FROM NORTH DAKOTA

Senator **Andrews**. The subcommittee will come to order.

Yesterday I was very much impressed by the caliber of the testimony that the subcommittee received from industry spokesmen as to their perception of the Nation's sadly lacking energy policy. We have heard from an eminent energy researcher, spokesmen for the electric power industry, both investor and cooperatively owned, and one of the Nation's most articulate leaders of the nuclear power sector, and the executive vice president of the National Coal Association.

They all voiced essentially the same deep concern that our system of energy supply is fragile, at best, particularly in rural areas of the country where the distances are great and the need tremendous, and the refining capacity limited.

They all outlined very graphically what is happening in the energy industry because of excessive regulatory and environmental requirements.

Today, the last of these hearings, we will be hearing from a somewhat different group. While yesterday was the day for the supply-side (no pun intended) of energy, today's witnesses represent the users side, the receivers. This is where most of us find ourselves.

Our witnesses represent a broad array of consumer interests, with the accent on what is happening, what could happen in rural America if a sudden disruption of supplies of energy should occur, as it has twice in just the last decade.

Yesterday's witnesses might be called special interest voices. Today's are even more special interest because they speak for the consumers, the producers of food for the millions of Americans who so strongly believe this country can become energy independent and must become energy independent, and a man who understands the intimate relationship between food energy and fuel energy.

As I indicated yesterday, I urged the administration to peruse the testimony given at these hearings. I know that my colleagues on this subcommittee and throughout the Senate would welcome a reaction of the administration at some future hearing, either in this subcommittee or before any other appropriate committee of the Senate.

Our first witness this afternoon is Kenneth L. McFate, president of the National Food and Energy Council, Columbia, Mo.

Mr. McFate, welcome to this hearing, and you may proceed. I appreciate your coming. Your complete statement, without objection, will be included in the record.

The Senate is in a rather unusual situation today, and tempers are a little short over the supplemental appropriations bill that we got from the House, and the House equally is feeling a little short tempered about our budget bill. Shortly before 3:00 there will be a series of votes probably that will interrupt the proceedings. It will not interrupt you. You will be in great shape.

Let me assure you, as I said, that your testimony will be put in the record as though you went through every word of it. If you want to summarize it, that would probably save a little bit of time and leave more time for the questions and answers.

In any event, I am glad to have you here. We certainly appreciate very much your taking part in presenting your ideas and your comments to be made a part of this record.

STATEMENT OF KENNETH L. McFATE, PRESIDENT AND EXECUTIVE MANAGER, NATIONAL FOOD & ENERGY COUNCIL

Mr. McFATE. Thank you, Senator.

I am real pleased to be here. I certainly appreciate your taking the leadership role in addressing this issue.

The part that I would like to speak to is the availability and the timely use of energy in the food system. Let me assure you I will summarize my comments because they are a bit long.[1]

First of all, during the past 50 years, the U.S. population has increased by 97 million. In that period of time our American food system has become the envy of the world. Many of us know that The farmer productivity has increased about 1.5 percent per year. The farmer now produces on average enough food for himself and 75 others. This certainly is a miracle.

The miracle of American agriculture has come about, in my opinion, by many interacting, interdependent factors. Among these, of course, is the low cost and ready availability of energy in the past, aggressive farm mechanization and farm electrification programs, generous use of commercial fertilizers, herbicides and insecticides, a minimum of constraining and costly regulations, a publicly supported national agricultural research and educational system, and certainly, last but not least, the innovative farmers that are willing to quickly adopt new technologies. This combination has brought about this miracle.

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[1] See p. 105 for the prepared statement of Mr. McFate.

As a result, the average American family can now purchase food that they need for about 17 percent of the family paycheck. The food consumer will continue to be the primary benefactor of timely use of energy supplies.

The Nation's energy suppliers, I think, are to be commended for the job that they have done in spite of the many constraining confrontations, if you will, during the past 10 years.

The Bureau of Census tells us we can expect an 80 million increase in population in the next 50 years. Now, to feed those people, we are going to have to have a lot of new technology. We are going to have to have new energy. We are going to have to have the full development of energy in all of its forms. Certainly we have got to continue the better management practices.

We need to look more strongly at energy substitutions. We must do this in all sectors of the food system, not just in agriculture.

I believe government and industry can and must play leading roles in creating an atmosphere and a climate that fosters greater public understanding not only with regard to our food supplies, but with our energy supplies and the critical interdependence between the two.

On-farm energy use comprises about 3 percent of the total energy use in this country. If we look at the total food system, we increase that to about 16.5 percent. These are common figures. Many people do not realize that almost three-quarters of that is coming from natural gas and oil, as far as the total food system is concerned.

Natural gas provides half the energy for irrigation in many of our Southwestern States. In other States, California, Idaho, Nebraska, et cetera, electricity is the primary power source for irrigation.

Interestingly, in this area of irrigation we can make large improvements from the standpoint of energy efficiency and water use efficiency. I will come back to that in a little bit.

Certainly irrigation is one of the things we must have. Many of our lands would be barren and unproductive if we did not have water applications at the right time and in the right place.

Too often, we think about water for production benefits only. When we stop to think about it, water application really preserves the energy already used for the seeding, the tilling, plowing, and planting. If we did not have it, we could lose a lot of production energy due to water deficiencies.

The timeliness of energy application and production is ever so important. Your farm experience tells you, I am sure, that if a farmer gets behind 1 or 2 days, he certainly has lost on the other end, whether it is getting behind in planting or harvesting. It can hurt from a standpoint of both yields and in optimum return. I cannot overstress the matter of time and timeliness, as far as energy use on the farm is concerned.

Electricity plays a key role on dairy farms, in irrigation, of crops, and for livestock, also poultry production systems. We would have an awful lot of losses if we did not have electricity available at the right time.

As we move into the cold and the hot periods of different seasons, any time we have poultry or livestock losses due to a lack of energy, the food consumer has to bear the higher cost. Such losses do affect food prices at the supermarket.

So we have those aspects to look at. Available energy supplies for our crop production can affect consumers in another very important way. Our country, as we all know, exports a lot of grain. In fact, it exports products grown on 1 out of every 3 acres. The dollars we receive offset much of the cost of imported oil. This benefits all of us.

In effect, if we stop to think about it, we can logically say that one-third of all the energy used on our farms goes for producing grain for exports.

When we grow these crops on marginal lands, as we have had a tendency to do in recent years, because grain production is where higher returns for farming has recently been, we face the danger of increased soil erosion. We are seeing much of this; and we face the danger of losing the future productivity of many of our land acres.

So the availability and use of energy for food exports gets very complicated. It gets more complicated than some wish to realize.

Farm fuel and energy expenses really make up only a small percent of the total production input. It is about 6 percent. Consequently our agriculture economists tell us that a doubling of energy prices would result in about a 13-percent increase in farm commodity prices.

On the other hand, if we had a 10-percent shortage, we could see an increase in food prices of perhaps 55 percent. What I am saying is that a shortage has an energy greater impact upon the food price at the supermarket than does the increase in the energy cost to produce it, at least in the near term.

I think it is safe to say that we certainly do have some factors that we must consider from the standpoint of the well-being of our people, as well as the Nation.

Overregulation was touched upon yesterday. I will not speak to that in any great length except that I would like to point out, and perhaps reemphasize, some of the points made. The cost of energy does, indeed, impact upon food costs. In mid-Missouri the cost of pollution control equipment on a new generating plant was 1⅓ times as much as the total cost of a similar sized plant built just 12 years earlier. The pollution equipment actually was 25 percent of the cost of that plant.

Indirectly I get my electricity from that plant. My rate went up 23 percent last month. Regulations do have cost impacts. But, I am not so concerned about my rate increase as I am the farmer's. He has to depend upon it much more than I do. In many geographic areas I think that we have a sufficient electric generating capacity, at this time, so that farmers could be substituting electricity, especially for the stationary operations of on-farm food production.

This idea of substitution is certainly not a new one. I personally encouraged such substitution over 30 years ago; on Midwestern farms where we encouraged electric feed grinding, as opposed to large power units using fossil fuel and PTO units; and this did several things.

First of all, it reduced labor. It reduced the cost of production. It reduced the use of prime fuel, even though we really did not fully recognize the importance of what we were doing at that time. It improved the local power supplier's load factor, which of course improved the efficiency of the total system operation. This was because we were using this equipment at night.

Now, today in many areas the electric power supplier is often restricted as to how much an adviser can really advise relative to energy substitution. This is pretty important when we are trying to reduce oil imports.

I think we need more education on energy management. And I would call this energy education, rather than marketing. Yet, some regulating agencies look at this aspect of substitution as one of marketing. We do see some restrictions in many areas.

Before I leave the subject of coal and electricity, let me just say that a report came out of my alma mater, Iowa State University, recently that sulfur emissions actually have enhanced corn production in Iowa in some studies. Also just recently released was an Iowa State University report on the effect of a 340,000 volt line. Where pigs were raised underneath this line, they actually gained a bit more than those in the control group.

I mention this merely because I hope those in policymaking situations, I hope they will consult with the agricultural scientists before the new regulations on those kinds of things are made.

Senator **ANDREWS**. We have researchers in upstate New York that would be thrilled with that type of project. I was intrigued. I got my degree in agriculture, not in political science or law. I remember the time you are talking about when we shifted from the power takeoff units to the hammer mills. Before you had to grind and you would belt up and grind your corn for half an hour to get it done. It was cold; it was not the time you really wanted to do it. You would have to start a tractor in the middle of the winter, and they went to devising these smaller electric units. Horvick Manufacturing Co. built the Viking hammer mill. You probably remember it.

Mr. **MCFATE**. It is the exact one I am speaking of.

Senator **ANDREWS**. It was 1 horsepower and 3 horsepower. I think 3 was about the max. You put it up below a bin, and turn it on, and it would run through the night, grinding away until the bin up above was empty. It was no problem at all, because there would be more space below for it to drop in, than there was grain in the bin that it was coming out of. Farmers have a way of figuring those things out quite well.

Mr. **MCFATE**. You are right.

Senator **ANDREWS**. It worked with a minimum amount of energy input and a minimum amount of human input. The grain was in better shape after it was ground than to do it out in the wind where you would have to belt up that tractor. You also used probably one-fourth the amount of power, and the power you were using was coming from, in this case, coal-fired energy plants using domestic sources of fuel instead of imported.

Mr. **MCFATE**. Right.

Senator **ANDREWS**. So everybody came out ahead. Yet now they are telling our rural electric distribution co-ops that they cannot advise their member patrons that they should shift to fuel pumps to heat their home with.

Mr. **MCFATE**. This is true.

Senator **Andrews**. Even though they can heat their home for what, two-thirds the cost of heating it with fuel oil in a State like North Dakota. They are precluded from going out there and saying, "Hey, use this energy." I guess it is not supposed to be patriotic. Somebody came up with the rule 4 or 5 years ago, and we have been trying to get it changed. I do not know that we have got it changed yet, but it is ridiculous.

Mr. **McFate**. Well, the opportunities for substituting coal generated electricity for our more precious fuels, gas, and oil, are certainly there. It is a matter of having a little team effort, a little guidance, and not only doing the job less expensively, but doing it with those fuels that we have the most of.

Senator **Andrews**. I will get you a good steak dinner you did not think the chairman of this subcommittee would know about a Viking hammer mill.

Mr. **McFate**. Yes; I did. I had an inside track. I was in your State about 3 weeks ago.

Senator **Andrews**. Then you have been inquiring around. That is when I can get into a lot of trouble.

Mr. **McFate**. The topic just came up. I think it is of interest to note that I was speaking before a group in your own territory, and I made a comment about substitution somewhat similar to this, and they merely said that you would know about that, and you do. You proved they were right.

Well, turning to a little bit different viewpoint, but not too much really, because what we have been talking about is a matter of education, a matter of research, and in many States we do have a very close dialog and in some cases good working relationships, with the university research facilities, their people and with energy suppliers.

So I am making this point that just as it is important to recognize the interdependence of food supplies and energy supplies, I think it is important to recognize that there are many interacting relationships between publicly supported agricultural research—I am speaking of the experiment stations primarily—and the energy needs and challenges that face us all, as food consumers.

I think it is important to recognize that we do have a body of knowledge and a group of experts that can, and often have quickly formed interdisciplinary groups with appropriate kinds of background and knowledge. These interdisciplinary research opportunities that exist at the State universities and at the experiment stations, I think, should be and must be better funded than they have been, at least in the past 10 years. Public support has not really kept up with the inflationary factor.

I guess this reemphasizes a comment that was made yesterday in that if we have a good agricultural base, many of the other things can, indeed, take care of themselves. We have reached the point, though, where we have a plateau, if you will, with on-the-shelf technology, merely because we have not had the research support at some of our State universities that brought us to this point; that brought us to the early seventies through the miracle of agriculture.

I think we have got to tell the general public that the food system has benefited all of us—all food consumers. We have got to make it known that we must work as a team. We must be sure that agriculture does have adequate amounts of energy.

Farmers are turning to other kinds of energy. They are using solar for warming livestock housing. Most of this has come about through the work of some of the researchers and scientists at the State universities who I mentioned.

The total contribution that solar energy will make to solving some of our real energy problems is going to be relatively small, even though the individual passive and active solar systems that farmers can readily use will apply to some part of food production. I think perhaps there may be more opportunities for on-farm fuel production, like methane from livestock wastes where the units of livestock justify that; like alcohol production; and like vegetable oil substitutes which are being studied in your State of North Dakota at this present time. I think that may move us a bit closer toward freeing the farmer, if you will, from off-farm energy supplies.

But there are concerns there, too. These fuel developments will require electricity. We talked about running the feed mill at night. I think we have an opportunity to press oil out of sunflowers and soybeans during nighttime periods. If all the other things are feasible, this certainly would help, make the use of generation, transmission, and distribution facilities of power suppliers more efficient.

It is a kind of combination of things that we must look at. There are no simple answers to many of our real energy problems.

There is another factor, I think, that we must address. When land is used for fuel production, we must recognize the effects of soil erosion. We have got to recognize, as I mentioned before, the future productivity of the land, and we have got to recognize the effect of the varied volumes of food for export. Then, of course, we run into the overall food versus fuel concerns that many have talked about and which must be addressed.

In summing up, if I were going to recommend some guidelines, I would say we must continue with sound energy management in all links of the food chain, on-farm and off-farm. I feel that conservation is one part of good energy management. It is one part only. The time and timeliness of energy use is another; and there are other very important parts, like substitution.

We should use the more plentiful and renewable fuels as substitutes whenever feasible, especially substitutes for those fuels that are in short supply. This, of course, is especially relevant to the mobile power units on our farms.

Our more abundant fuels should be used indirectly, as we have already discussed, for powering the stationary operations.

Electric energy used automatically with low horsepower units over long periods of time, as we have discussed, will certainly make a contribution to the overall efficient use of the energy sources and resources that we have.

I think we must expedite some developments of new technologies, especially those that lead to the more efficient use of energy in all links of the food chain. I would reiterate that the agricultural research system that we have in place that brought agriculture to where it is does need adequate support because much of the activities and much of the work that is being done has energy implications, directly or indirectly.

We had a report out of the Missouri station not long ago that notes improved beef production per acre of a certain kind of fescue, of 25 percent. This comes back to the use of our marginal lands for something other than crop production.

Where there are no substitute fuels for the mobile operations, then I think we must set some priorities on distribution and use of appropriate fuels. I think we must foster communications programs, and the Food and Energy Council is trying to do this through education.

There are certain aspects of the overall energy program of the past that have bothered me. Different people have a different meaning for the word "conservation" for the term "conservation energy," and the term "energy self-sufficient farms." These mean different things to different people, and perhaps we must redefine some of these in our communications and guidelines.

Last but not least, I think the national energy policy must certainly create an atmosphere and a climate which allows our energy suppliers to make the right choices, to take correct actions that will meet the energy requirements on a timely basis and at prices that we can all afford, because those energy prices do, indeed, impact upon all of us as food consumers.

I think that national decisions on energy availability must be made, and they must be made before the energency situation, to which you referred, arises.

I commend you and your staff for taking the initiative to address this issue, and I think the time and the timeliness of decisions may be more important or as important as the decisions themselves.

I appreciate the opportunity to visit with you, and to make these views known to your committee. This concludes my summary.

Senator ANDREWS. We certainly hope that the testimony we are getting in the record will be used by not only the Members of the Senate, but people in the administration and, more particularly, people interested in the agricultural sectors throughout the country.

I think this is the first time all of this has been assembled in one place in public testimony from these kind of different viewpoints all blending into one.

Earlier you mentioned in your testimony you thought there were some areas of marketing activity and salesmanship in the electrical distribution cooperatives or private utility marketers that could be done to advise their customers on better ways of using electricity. Have you got a couple of others in mind where they are being prohibited or, shall we say, inhibited?

Mr. MCFATE. They are certainly inhibited. I guess to be real fair I would have to say that, in some cases the expertise that we have among the power suppliers are putting out fires or handling large bill complaints rather than doing the job, the educational job, which I prefer to address it as, rather than as marketing.

Senator ANDREWS. You see a shifting out in the field from being one of an effort to teach their customers how best to put electricity to use and a force out in the field trying to explain why the rates are going up.

Mr. McFate. Yes. I think that we need leaders. The people we have on hand can be, and need to be leaders. They need to be in a position to guide their customers, whether they are farmers or food processing experts who are concerned about energy use, energy costs, and electricity future.

I think that they need to be in the forefront as some are.

Also we should help farmers understand that if you do it "this way," you may not only save yourself some dollars, but you will certainly have an impact upon the Nation's energy mix.

Senator Andrews. You touched on the fact that using farm products to create fuels could use the valuable resources that we need for food production. Do you have any thoughts on what the balance between using agricultural resources to create fuels and using them for food energy should be?

Mr. McFate. That is a difficult one.

Senator Andrews. Will it establish that balance when the price of the food products get up to where they ought to be? If the price of grain and other farm products approach parity, then even OPEC oil becomes cheap by comparison.

Mr. McFate. Based upon economic figures I have seen, you could not certainly economically produce alcohol for gasohol during the last calendar year. We can, of course, based upon best estimates, produce alcohol from 1 acre of land to farm another 20 acres of land. We can perhaps produce soybean oil sufficient that we could farm about 5 acres of soybeans.

What I am trying to say is that on-farm fuel production is important, and we ought to look at the possibilities. Perhaps a guideline to be considered is that we use those fuels produced on the farm only for producing more food. That in itself, plus the economic situation, I think, will give us the balance that we might be looking for.

Senator Andrews. In your judgment do you think the Nation has an adequate energy policy, particularly as that policy pertains to the food production for energy?

Mr. McFate. I think not. I say this for several reasons. I have talked with food processors who would like to depend more on electricity, but they have a feeling that maybe that electricity will not be there when they need it a few years hence. That is one aspect of this picture, perhaps the more important one.

Senator Andrews. What steps should we be taking as to this policy?

Mr. McFate. The specific steps, I guess, I am not in a position to address; but certainly the overall policy ought to look at having priorities in distribution and the use of energy, in whatever form they are needed to assure us of an adequate food supply for the people in this country and for whatever exports we need to have for a reasonable contribution to our balance-of-payments situation.

I think it is hard to define a policy at the present time. There are bits and pieces here and there.

Senator Andrews. It was awfully nice of you to come. We certainly appreciate your testimony and your responses to the questions.

Mr. McFate. Thank you very much.

Senator **Andrews**. We now have the honor of having one of our colleagues, the Senator from Minnesota, Mr. Dave Durenberger, the coauthor of the Energy Conservation Act for Agriculture in North Dakota, known as the Andrews-Durenberger bill and in Minnesota known as the Durenberger-Andrews bill.

STATEMENT OF HON. DAVE DURENBERGER, A U.S. SENATOR FROM MINNESOTA

Senator **Durenberger**. Thank you, Mr. Chairman.[1] I am pleased to appear before the subcommittee, and I want to thank you for the several days of hearings concerning the problem. I can only hope and pray that they will be enlightening to more than you and I and the people that attend the hearings.

You and I represent neighboring States, both of which are agricultural States. But more than that, I think we represent the shared concern that you indicated in the energy security of our whole Nation.

Emergency oil allocations, financing of the Rural Electrification Administration, incentives for conservation and renewable fuels. All of these are issues that I wish we did not have to work so hard at all of the time, but they have been an essential part of energy policy in this country to one degree or another for a long time, and I think we are now at the stage where we are trying to determine whether that is an appropriate policy, and having to demonstrate to a lot of people that it is.

Very recently there were several hundred Minnesota farmers who gathered at the State capital in St. Paul to protest conditions that were forcing many of them out of the agriculture business. A newspaper reporter went up to one of the people and asked him where his farm was located, and the fellow said he was not a farmer. He was a teacher from the Twin Cities. So the reporter said, "Well, what are you doing here?" And he answered, "I like to eat. Food does not grow in supermarkets, you know."

Senator **Andrews**. We need more teachers like that.

Senator **Durenberger**. That is right. We need more consumers like that. I think there are probably a lot of them out there. But very simply, that little incident illustrates that everybody in this country has a substantial stake in the success of the farmers in this country.

On top of all of our economic problems, the ones that are currently making all of the headlines, there is a risk that farmers take that no longer makes headlines, but one that they are going to face every time they go into the fields in the spring. That is the risk that when it comes time to harvest in the fall the energy supplies that they need will not be sufficient to get the crop out of the field. And I think one of the issues that I am concerned about and you are is that Government and this Nation are not prepared to do anything about that kind of a shortfall.

I think we are seeing the systematic dismantlement of this country's energy policy. This administration appears determined, some how or other, to undo the energy policy that it took the Congress and the Nation a decade to design.

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[1] See p. 112 for the prepared statement of Senator Durenberger.

The President recently sent us legislation to abolish the Department of Energy and the incentives for conservation and renewable fuels, to halt the loan guarantee for alcohol fuels and renewable fuels, to terminate the low income home weatherization program, and reduce the loan authority for the REA.

As you know, just a little over a month ago he vetoed what was a very carefully drafted and critically needed bill, the Emergency Petroleum and Allocation Act. Today we are trying through the REA to see that we do not undo any of that work.

The unfortunate thing is that the President vetoed that bill and did so with an argument that he consistently keeps offering as he goes about the dismantlement of energy programs. That is the Nation ought to rely on the marketplace, solely on the marketplace, for the decisions that determine our energy future.

Well, as a person, as a Senator and as a Republican, I guess I agree that the marketplace is to be preferred to the Government as a device to allocate goods and services, but being Republicans does not require that we be blind to the actual conditions in a particular market that face our constituents every day of their lives.

Senator ANDREWS. In fact, as someone said once, you do not have to check your brains at the door to be a Republican.

Senator DURENBERGER. Must have been a North Dakotan.

Senator ANDREWS. Sometimes we wonder with some of the vetoes we have seen coming around here lately.

Senator DURENBERGER. Well, I think our disagreement with this administration on energy policy is a deep and a serious disagreement. I, frankly, find myself, both when I am making speeches out here and when I am back home, articulating the depth of this disagreement and finding an awful lot of people who agree with me rather than the President on a lot of other economic matters, but who agree with him on marketplace theories all the time. But on the energy issue the reality and his perception of the reality are very, very different.

Senator ANDREWS. Well, in the rural areas they have been through it twice.

Senator DURENBERGER. Right.

Senator ANDREWS. In the upper Midwest, Minnesota and North Dakota, our farmers, our small town people have been through this petroleum emergency on two separate occasions. We were running trucks in from 50 miles away trying to get enough to just skimp through.

The farmers had to leave their tractors standing in the fields. That is no way to run an economy.

Senator DURENBERGER. That is right.

Senator ANDREWS. That is why we introduced the bill.

Senator DURENBERGER. I think the frustrating thing, of course, is who right now is determining the energy availability and price future of this country. I have yet to meet the farmer or practically anybody in my constituency who does not believe that the OPEC cartel still controls both supply and price, but that is not a belief that seems to be shared by the President or by this administration.

They talk about gluts all of the time, but the fact of the matter is that the marketplace is beginning to show signs of trouble. The petroleum and the crude oil stocks are going down in the hands of the refiners.

Senator **Andrews**. And the prices are going up.

Senator **Durenberger**. And the prices are going up. The Minneapolis Tribune this morning reported that the agricultural industry in Minnesota is now starting to have trouble with supplies and prices. The prices are up a nickel, and that is a direct result of lower inventories.

Senator **Andrews**. We have had calls on diesel fuel shortages for the last 3 weeks.

Senator **Durenberger**. Is that right? Well, it is finally getting to Minnesota.

The last point I want to make is with regard to something you know a great deal about, and that is the future of REA. Again, the view of this administration as it relates to electric energy is much like its view on petroleum products. Dave Stockman and his clipper is in there just cutting out the program, not realizing that the entities with which we are dealing, the generating cooperatives, are totally debt financed. They are not equity operations like some of the privately owned or investor owned utilities.

You cannot expect them to go into the marketplace the same way everybody else goes in. They will be laughed out by every banker in the State.

These are two of the important reasons that I wanted to come and share with you, both for the record and in whatever form, to join you in trying to raise the level of understanding on the part of this administration—on the part of this country—of the potentially serious nature of energy problems as they impact on those who are least able to help themselves, those who live in rural America and those who depend on agriculture for their subsistence.

I appreciate what you are doing over this 2-day hearing.

Senator **Andrews**. I appreciate so much your coming and adding what you have to the hearings.

I mentioned yesterday the strange disparity in the administration's request. They come before those of us who serve on the Defense Subcommittee and say we need $26 billion this year for a Rapid Deployment Force. A Rapid Deployment Military Force to do what? To protect our access to the Middle East. Why? So that we can get somebody else's oil if we need it.

So we are spending $26 billion in this country by administration request to keep our mitts on somebody's oil, and we refuse to spend $1 or $2 or $3 billion to build the synthetic fuel plants or the rural electric generating plants or whatever else that are needed to help make us energy independent. It just does not stack up because all of that oil that we import from overseas not only leaves us wide open to the type of military adventurism that some other country might want to use to embarrass us, but it also subjects us to the imbalance of payments that has gone a long way in the last 2 or 3 years to bring about the inflation and the high interest rates that are plaguing the rest of our economy.

So these are some of the things that I hope we can convince Mr. Stockman and a couple of others that hide away some place in that haven known as OMB are important. I do not think they would know a steer from a cow, and yet they think they can run a farm program and a rural electrification program and an energy program for rural America.

It is great to have you on board.

Senator DURENBERGER. Thank you.

Senator ANDREWS. I appreciate your being here.

Without objection, we will include in the record a statement by Senator Exon[1] along with an accompanying report from CRS on the effects of natural gas decontrol on farming costs and income.

Our next witness is Mr. Stephen Brobeck. He is executive director of the Consumer Federation of America.

Mr. Brobeck, welcome to the subcommittee. We appreciate your making the effort to be here, and as I have told the other witnesses, you can be assured that your statement will appear in full in the record. You can summarize in any way you might want to.

STATEMENT OF STEPHEN BROBECK, EXECUTIVE DIRECTOR, CONSUMER FEDERATION OF AMERICA

Mr. BROBECK. Thank you very much, Mr. Chairman.[2]

I am here representing a coalition of more than 200 organizations around the country that are seeking to represent the interests of all consumers, rural as well as urban and it is for this reason that we commend you for organizing these hearings, and we greatly appreciate the opportunity to present our viewpoint.

There are two kinds of rural energy needs that affect consumers, and I would like to talk very briefly about both of those.

The most obvious are the energy needs that affect rural consumers directly; the other kind of need is those of agricultural producers, which of course affect retail food prices that are paid by all consumers.

A surprisingly large number of Americans live in rural areas, over 60 million, about 28 percent of the country's population; about two-thirds of these live in the South and the Midwest, and a surprisingly small number actually live on farms, about 20 percent.

Rural consumers have somewhat different energy needs than their urban counterparts. Basically they do not consume quite as much natural gas, but they consume proportionately more electricity and fuel oil, as the table on page 2 of my testimony indicates.

A second difference between rural and urban consumers is that rural consumers are far more dependent on energy prices than are urban consumers for several reasons. First, they need more energy to subsist because their housing is more likely to be old, dilapidated, and detached, less energy efficient.

Second, they have longer distances to travel, especially those living on farms.

Senator ANDREWS. There is no Metro for them.

Mr. BROBECK. Practically no mass transit systems in rural areas, and for some rural consumers, the distances between home, on the one hand, and work or church or the market are very substantial.

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[1] See p. 119 for the prepared statement of Senator Exon and p. 120 for the CRS report submitted by Senator Exon.

[2] See p. 127 for the prepared statement of Mr. Brobeck.

Moreover, rural consumers, on the whole, have lower incomes than urban consumers. Their income is about 20 percent lower, and a significantly higher proportion of these rural consumers than urban consumers are poor.

For these and other reasons, during the 1970's rural consumers were hurt much more by rising energy prices than their urban counterparts. The rural electric cooperative customers, for example, saw their electricity prices rise by about 150 percent, reflecting both the rise in the price and also some increased consumption.

Of those some 60 million people living in rural areas, about 7 million work or live on farms. They, of course, have to pay the residential costs, but they also have to pay for energy in their agricultural production.

They are especially dependent on petroleum. About two-thirds of the energy they use on the farm represents oil, and they were also hurt more by the 300-percent runup in petroleum prices in the 1970's than were urban consumers because of their heavy dependence on farm cooperatives that refine petroleum and their dependence on independent refineries.

The problem here is that independents and the co-ops enjoyed poorer access than major companies to crude oil, and as a result, first in 1973 and again in 1979, we saw that the independents and co-ops were denied access to crude oil.

Senator ANDREWS. In fact, that is the reason for the Emergency Energy Allocation Act that Senator Durenberger and I cosponsored. Crude oil did not move freely in those two emergencies between refineries. If it was as available as wheat is and you could get it for the break cost anywhere in the country, that would be one thing, and the free market would, in essence, be working.

But the free market did not work on two separate occasions, and we found the independent refineries and the cooperative refineries that uniquely serve agriculture running at only 40 and 50 percent of their capacity, while other refineries were running at 80 to 90 percent of their capacity.

It is tragic because those smaller refineries serve an area of the country that is isolated from any other product and they simply cannot get replacements for oil.

Mr. BROBECK. And they had to pay higher prices.

Senator ANDREWS. They had to pay higher prices in all instances, and they had the disastrous problem of not getting supplies for 2 to 3 weeks. In a time-sensitive business such as agriculture and food processing, if you miss a couple of weeks, you can lose a whole year. So it has been pretty tough.

But you say it very well. Do not let me interrupt you.

Mr. BROBECK. We agree entirely with your analysis on this issue and that is why we testified on the subject on a couple occasions.

Senator ANDREWS. I serve as chairman of the Transportation Appropriations Subcommittee. We fund urban mass transit, and we are putting more and more commitment from the overall economy into urban mass transit. Why? Well, to encourage people to get out of their cars. That subsidy goes for people who can use it.

But it is being paid for by the person out in the rural area who cannot use that kind of transportation. The fuel price goes up to serve as a disincentive and encourage people to use mass transit. It may be a disincentive and it may encourage people to use mass transit, but those people who do not have the choice just keep getting it on the chin, and they pay more and more for basic transportation.

These are part of the inequities that are hitting our country. Go ahead.

Mr. BROBECK. Of course, it is not only the farmers that are suffering the consequences of rising energy prices. It is also all food consumers, everyone in the country.

Senator ANDREWS. That is right.

Mr. BROBECK. Everyone is having to pay higher prices, and we are especially concerned about what is going to happen to food prices if there is a major disruption of petroleum supply. A 1980 U.S. Department of Energy study estimated, for example, that just a 10-percent reduction in supply, which OPEC could easily cause, would increase raw commodity prices by 55 percent, and our own energy specialist, Ann Lower, estimates that a 20-percent shortfall could kick oil prices over $5 a gallon, which would impose additional costs on farmers of over $10 billion. That is an awful lot of money, and it is a cost that in part will be passed on to all consumers.

Senator ANDREWS. And anhydrous ammonia, which is the basic fertilizer used in agriculture, is almost entirely coming off of natural gas. As natural gas prices go up, anhydrous ammonia prices go up. As a matter of fact we are looking forward to tripling in price in the next decade, and that is another tremendous input.

Mr. BROBECK. We would agree entirely with what Senator Durenberger said about the threat of such a disruption. Everybody thinks that the oil crisis is over, but what has really been happening is that OPEC cut back production very substantially, and oil companies draw down their inventories, and now U.S. demand for foreign oil is on the increase, and it is really not too hard to imagine a reduction in supply resulting from OPEC's trying to punish us for supporting Israel or maybe something could happen to Venezuelan supplies because of the Falkland Islands crisis. Venezuela is one of Argentina's strongest supporters, and Venezuela has some influence within OPEC.

So I think that is cause for concern, and who knows what political crisis is going to develop in the next 2 or 3 years?

Senator ANDREWS. Two or three months, two or three weeks.

Mr. BROBECK. To conclude, what rural energy users need most is adequate supplies of moderately priced electricity, petroleum, and natural gas, which is used in the production of fertilizers and represents about 40 percent of all the energy used directly or indirectly in farm production.

We would argue that this need can best be met by the implementation of a national energy policy with four essential elements.

The first of these is that we need economically viable rural electric cooperatives. These supply much of the energy used by rural families and rural farms. Like investor-owned utilities that serve mainly urban areas, they have been victimized first by rising energy costs and now by high interest rates. But they have an additional disadvantage, and that is they serve areas with very low population densities which increases their capital costs. For that reason, for decades the Government has provided a small interest rate subsidy that the administration is now trying to eliminate. Of all the times to eliminate the subsidy, now is the worst time in the history of the Rural Electrification Administration and its programs. Senator, we strongly urge you and your colleagues to resist that effort to eliminate this subsidy that is equitable and benefits all consumers because of urban-rural interdependencies.

Senator **Andrews**. Well, in the Senate budget bill that is now before the House, there is an amendment that I cosponsored as a member of the Budget Committee keeping rural electrics at the same level of funding availability both from the FFB and also in the low-interest loans for the distribution co-ops. So, if again we can win the fight with the House in the conference, we will have a budget act, and then we will try to follow through with it in the authorizing committee as well as the appropriating committee.

We have been successful in the past. I think we can again, but your support for this and your strong statement in favor of it helps us an awful lot in getting it done.

Mr. **Brobeck**. Senator, we pledge our continuing support on this issue.

I should just add very briefly that the rural electric cooperatives need less expensive credit, and it is for that reason that they have joined with CFA and with the National Farmers Union and with the NAACP and a number of urban organizations in supporting the National Council for Low Interest Rates, which is now backing legislation both in the House and in the Senate.

The Senate bill, S. 2526, was introduced by Senator Cranston a couple of weeks ago, and that would extend the Credit Control Act of 1969, which does not mandate anything. It just provides an opportunity for the Federal Reserve and the President to discourage nonproductive uses of credit.

The second element of the national energy policy that we think is essential is more conservation. Rural consumers need conservation. It was tragic that the administration was able to persuade Congress to eliminate the low income weatherization program, which represented a real solution to the problem because it would reduce energy demand. Instead, we are left with a badly needed low income energy assistance program, which fortunately was not cut back much.

In addition, the Government should do whatever possible to promote greater energy conservation in farm production. They could do this, for example—and we have not thought about the details of this—by encouraging greater fuel efficiency in farm machinery, in farm vehicles, and also whenever appropriate by reducing the use of fertilizers and pesticides since they are so energy intensive.

The third element of our national energy policy is that the President needs the authority to allocate and price petroleum. We were very disappointed that the President chose to veto the extension of the Emergency Petroleum Allocation Act, and if there is any way that we can raise this issue in the future, CFA would fully support bringing that issue up again.

Finally, particularly because so much natural gas is used in the production of fertilizers, we think it is essential to leave the Natural Gas Pricing Act alone. The NGPA, despite what some people say, clearly provides adequate incentives for exploration and drilling, and it will not cause a significant fly-up in prices when the act expires in 1985, if the contracts problem is solved, if these escalator clauses that are built in are changed, and Congress can do that, and we hope that it will.

But from the perspective of rural consumers and urban consumers, as well, if you decontrol the price of old gas, it is going to lead to tremendous increases in the cost for all consumers, perhaps increasing average residential heating costs from $400 to $500 to $700 to $800.

We have also seen an estimate by one organization that decontrol would increase the cost of farm production over $8 billion in the next 3 years primarily because of the farm dependence on fertilizers.

Moreover, it has been the decontrol of oil prices which has led to a massive shift in resources in our society, away from industrial users to energy producers. This makes the reindustrialization that we need in our society, to become more competitive internationally, so much more difficult when the capital is flowing out of this area.

Let me conclude by stressing that the national energy policy I have just outlined acknowledges the fact that in today's world, while the free market is a very efficient allocator of resources, it is not perfect. It does not always bring maximum efficiency or equity.

So we believe it prudent for the Federal Government to take steps to minimize any future disruption from the loss of foreign energy sources. Economic theory does not take awareness of the fact that there can be politically caused disruptions in supply.

Second, we believe it prudent for the Government to promote energy conservation, and finally, we believe it equitable for the Government to assist rural consumers and producers in paying for higher energy prices than those which are incurred by urban residents.

Mr. Chairman, thank you again for the opportunity to comment on rural energy needs.

Senator ANDREWS. Thank you for a most interesting statement.

You make a strong and important point about the lower income of many rural people and the higher prices they pay for energy as compared with the urban people. Could you elaborate on that? Could you give us any further thoughts you might have on what can be done to rectify the situation other than the Emergency Petroleum Allocation Act, which regretfully was vetoed, and the stronger backing of the rural electric co-ops? Have you any other suggestions?

Mr. BROBECK. We have got to preserve the strength and the economic viability of small farms.

One of the most important reasons there is so much poverty in rural areas and such a large migration over the last 40 years from rural to urban areas is because it has been so difficult for small farmers to make it.

Senator ANDREWS. It is difficult to get the electric service and the water service and the other services that you need, so they drift into the big cities. But that costs the Federal Government even more to take care of their needs there than if they had been encouraged to remain in their original community.

Mr. **Brobeck**. That is right. We have to remember, too, that small farms can be somewhat less efficient than larger farms, but there is an ultimate benefit to society because there is more competition. The competition ultimately keeps the prices of farm products down.

Senator **Andrews**. Last year in the Washington Post the Consumers Organization pointed out that high electric power costs are preventing the low-income consumers from purchasing adequate food and medicine. In other words, they had to pay the electric cost, and it shorted the amount they had in their budget for the other two requisites: food and medicine.

In your experience, is this becoming a serious health problem in some urban or rural areas, in particular?

Mr. **Brobeck**. We have some isolated examples of problems occurring. People have experienced difficulty resulting from this problem.

There was a lot of attention to the problem of rural poverty 20 years ago. There has been very little attention since then. It is our hope these hearings will spark renewed interest in this problem. To my knowledge, there is no general, careful study that gives us a total picture and patterns of problems in this area.

However, we do know rural electricity costs are higher. Second, income is lower. Third, rural consumers are less likely to have health insurance.

Senator **Andrews**. So they are more reluctant to go to the hospital. Therefore, they stay in their home. If they are short of food because of the lack of the wherewithal to purchase it, they just continually sink lower and lower.

Mr. **Brobeck**. That is what happens if they do not have adequate transportation. If they are poor, that complicates the problem.

Senator **Andrews**. Also the death rates could increase as a result of the low temperature due to the lack of fuel.

Have any of your members expressed this view.

Mr. **Brobeck**. Again we have isolated examples. We can deduce that there would be an increase in this kind of a problem. We do not yet have careful studies that conclusively prove that.

One of the reasons that we do not read more reports of deaths related to high energy costs among the rural poor is because of the low income energy assistance program. This program is an absolutely critical one in keeping alive tens and hundreds of thousands of low-income consumers, many of whom live in rural areas.

Senator **Andrews**. In your statement you mention the migration of consumers from rural to urban areas. Do you attribute this migration largely to economic conditions or have social or cultural values played a part in the migration?

Mr. **Brobeck**. I think far and away the most important factor here is economic.

Senator **Andrews**. They prefer to remain in the rural area if they could?

Mr. **Brobeck**. Yes, they would. That is where they grew up. They are comfortable in those areas. Many of them prefer the warmer climate of the South. They came up to escape just terrible poverty that was documented in great detail back in the 1960's.

Senator **Andrews**. But more reasonably priced energy might encourage them to stay in those rural areas?

Mr. **Brobeck**. Yes. If electricity costs were reduced, we are looking right now at the averages I mentioned. Electricity costs for kilowatt hours for the rural consumers served by rural electrics are 12 percent higher than that of urban consumers. If we knock out the small subsidies, prices could shoot up to 40, 50, 60 percent, maybe even more.

Senator **Andrews**. It could be half again as much. In heavying up the lines, which they need to do, too many people think the job is done. But the job is not done electrifying the countryside because the line maintenance costs are much higher, because there are fewer consumers per mile, and the storms are tougher out there than they are in the sheltered areas of the cities. We have to maintain that type of funding.

On page 5 of your testimony you suggest several options for supplying these rural consumers with moderately priced electricity. Colorado Ute Electric Co-op reported that Government regulations account for 38 percent of their power production costs.

Should these regulations be eliminated or modified if the costs exceed the benefits to rural consumers?

Mr. **Brobeck**. Senator, there are all kinds of regulations, and there are regulations, of course, that benefit public utilities.

Senator **Andrews**. And are very necessary.

Mr. **Brobeck**. And are necessary, guaranteeing, for example, access to fuels. So I think we have to take each regulation on a case-by-case basis.

One point I would make is that a cost benefit analysis theoretically makes an awful lot of sense to do because we are in a society with limited resources. Yet, there is a problem in applying cost benefit analysis. It is so much easier to measure the cost than the benefits.

How do you measure, for example, the benefit of no pain and suffering? So this is a real problem here, but we would support any objective evaluation of the cost and benefits of specific regulations that affect public utilities.

Senator **Andrews**. Years ago when I was in the House we tagged on to a bill that the Government would have to have economic impact statements to go along with its regulations. It sounds as though you are looking in that direction now.

Unfortunately the Senate did not see the wisdom of what we had done in the House and it was knocked out in conference. But it would appear that you and your organization might think there could be some merit to taking a look at the economic impact of some of the regulations, as well as an environmental impact.

Mr. **Brobeck**. As long as we understand the difficulties of doing that measurement, of recognizing that to an extent it is like comparing apples and oranges.

Senator **Andrews**. It certainly is, but at least then it would be up front and the people would be better able to judge the efficacy of some of these rules and regulations.

Would it be a good idea to begin to substitute electricity for petroleum where we can, as we are doing in North Dakota, and using heat pumps to heat with instead of imported oil. If we could start a program of encouraging people to shift to using native fuels, we could gain that energy independence? That added to the conservation, which you mentioned earlier on, could give us some very worthwhile energy savings.

Mr. **Brobeck**. Well, yes; We would strongly agree with that. Of course, most of the fuel that is used by rural electric cooperatives is from coal.

Senator **Andrews**. That is right.

Mr. **Brobeck**. Coal is relatively inexpensive. It is very plentiful, and you do not have the severe pollution problems in rural areas that you have in urban areas. The latter, of course, is a great concern to us. But we think, generally, that substitution of coal for oil would make a lot of sense, and of course, would reduce our dependence on OPEC.

Senator **Andrews**. Thank you very much.

Mr. **Brobeck**. Thank you, sir.

Senator **Andrews**. You have added a good deal to our record.

Our next witness is Dr. Elihu Bergman, who is the executive director of Americans for Energy Independence in Washington, D.C.

Doctor, I have a little problem. The bells rang, and that means that there is a vote going on in the Senate and I have to leave to vote, if you do not mind waiting for a minute.

If you would like, while I am gone, you could read your statement into the record, and we could go on. I have had the opportunity to read it, but if you would rather wait, that is OK, too.

Dr. **Bergman**. I would just as soon wait.

Senator **Andrews**. OK. Fine. I will go over and vote and I will be right back.

The subcommittee is recessed for 5 minutes.

[Recess.]

Senator **Andrews**. The subcommittee is back in order.

My apologies for the problem that we had. I guess we are going to have a few more interruptions, but you may proceed and you may summarize or proceed as you wish.

The record we are putting together from yesterday and today will be helpful. It is something that was needed for a long time, and I appreciate very much your coming to add your version and your knowledge to it.

STATEMENT OF DR. ELIHU BERGMAN, EXECUTIVE DIRECTOR, AMERICANS FOR ENERGY INDEPENDENCE

Dr. **Bergman**. I appreciate the opportunity to be here. I have submitted my prepared statement for the record, and I want to make a few summary remarks and engage in this very interesting discussion with you.[1]

Americans for Energy Independence is a national public interest coalition representing many sectors of American society and providing a platform for people who are interested in policies that will reduce dependence on sources of foreign oil. We are very pragmatic in our approach as to how; basically we would support anything that works and works in the near term. We have been concerned about the energy requirements of the agricultural sector. In fact, several years ago we compiled some of the information in a pamphlet entitled "Farm To Table: The Food-Energy Link," which discusses some of the relationships between the food system and energy requirements that you have been discussing.

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[1] See p. 130 for the prepared statement of Dr. Bergman.

We are very pleased to have some representation, some very knowledgeable representation of this sector in our leadership. Bob Partridge of the National Rural Electric Cooperative Association [NRECA] is a member of our advisory council, and of course, we have worked closely with NRECA on a lot of common interests.

All of us should be grateful to you, Mr. Chairman, and the subcommittee, for supplying this very prestigeous platform in which the issue of energy security can be discussed, because over the past year the dual impact of oil glut and gasoline going as low as 99 cents a gallon has induced some complacency and some indifference to the problem.

Senator **ANDREWS**. Unfortunately that is probably more temporary than anything else.

Dr. **BERGMAN**. I agree it is. But I think we would like to see a permanent state of buyers' oil market, and we would like to see stable gasoline prices, but as you have indicated in some of the previous discussions, we are by no means out of the woods. By providing this forum to continue to discuss the issues, and educating the public, the subcommittee really is performing a great service.

Senator **ANDREWS**. Thank you.

Dr. **BERGMAN**. Now, in pulling together some of the material to discuss at this hearing, we were struck with an example of the continuing heavy cost to this country of our oil dependence. For example, when you consider the 1981 cost of oil imports to the United States, even at a lower level than the peak 1979, these oil imports cost us $71 billion. This is up from about $8 billion in 1973, when actually we had a higher level of imports.

Senator **ANDREWS**. In 1973 we were balancing our oil imports with our agricultural exports. Then in about 1977 and 1978, and we plateaued out at $40 billion for agricultural exports, and oil imports kept going up. That is when our balance of payments got so bad.

In fact, I think if we raised the price of wheat by $2 a bushel and had our Russian patrons pay closer to the cost of production for that wheat the average American consumer would find there would only be 2 more pennies worth of wheat in the loaf of bread that they are paying 65 or 70 cents for.

Our overseas income would be much more significant. We probably would save more as consumers in the break that we get with our inflation and interest rates than we would the extra 2 pennies. Somehow or other we have not been able to make that point.

Dr. **BERGMAN**. I think you are making it because tne net earnings from agricultural exports in 1981, that is, the difference between exports and imports, was about $26.5 billion.

Now, I think that and the remarks illustrate the imbalance here.

Senator **ANDREWS**. But we are exporting it below the cost of production, which is the idiotic thing. In the European economic community, they support wheat at $9.70 a bushel. We land at Rotterdam for $4.50. They put a $5 import fee on.

Our farm families and our economy are subsidizing the economy and the government of those NATO powers. They turn around and spend only half as much as a share of their gross national product for their defense as we do. Yet we have got 350,000 troops stationed over there.

The Japanese do us even better. They support the price of a bushel of wheat at $29.90 a bushel. They outsell us in Toyotas and Hondas and all other things.

I think you are putting your finger right on the point that somehow or another we have to gain energy independence. Somehow or other we have to put some economic sanity into our exports.

Dr. Bergman. That is right because this entire sequence influences such things as inflation and interest rates and other economic conditions.

Unfortunately, we are still in jeopardy as a result of this oil dependence, despite the glut and despite the current abundance of supplies.

On the cutting edge of this dependence as some of the previous witnesses have suggested, is the food system of America particularly the farm production system and the agricultural production system. This is because about 3 percent of our national energy consumption is devoted to agricultural production. A lot of it is oil, which is critical in terms of making it possible for the farm units to do their job.

This is a sector of the energy economy, despite its small size, that is important way out of proportion to its size. It is still extremely vulnerable.

Now, the question we have to address ourselves to is: What do we do about this beyond raising public consciousness and beyond raising the consciousness of the leadership of this country?

As you and Senator Durenberger earlier talked about, there are really two goals in creating national energy security. One is a short term goal. The other is a longer term goal.

The short term goal is this area of emergency preparedness. It is to protect the country, and all sectors of the economy, against a sudden unforeseen cutoff of oil supplies.

As was pointed out earlier, the farm economy and the national economy have experienced this cutoff twice in the past 8 years. There is an ever-present likelihood that we could experience this cutoff again. We observe the developments in the Persian Gulf, a resurgent Iran, a revolutionary Iran, which now having defeated Iraq, is in a position to realize some of the goals that the Shah wanted to achieve in controlling the Persian Gulf as the major power in the Persian Gulf region.

Only now what we have is a highly theological, highly spiritual and highly resurgent Islam. This force can create as well as add to the instabilities that already exist there.

Now, it is likely that the immediate victim of this pressure could be Saudi Arabia. There could be a regime change in Saudi Arabia, which could bring to power a coalition like came to power in Iran, a combination of radical modernists and traditional Islamic fundamentalists. This coalition, like the Khomeini regime in Iran did, could decide to reduce the oil production substantially and take 5 million barrels off the market immediately.

We know what happened the last time 5 million barrels of oil per day were taken off the market when the Iranian revolution occurred. It created chaos in world markets.

This contingency is an ever-present danger. What we need to do as a prudent objective for national energy policy is to protect ourselves. The United States imports about 1 million barrels of oil per day from Saudi Arabia. If 5 million barrels were removed from the market, this shortage would reduce our availability substantially. At the same time it would reduce the availability of our Western European allies, who are far more dependent on the Saudi oil than we.

So for immediate protection we would recommend that the Strategic Petroleum Reserve, this buffer, this oil bank, continue to be filled at the accelerated rate of last year; not at the decreased rate that the new budget envisions. At the same time, coupled with acceleration of SPR, the administration should have in place an emergency preparedness plan to get that oil, in case it has to be used, from the salt domes in Texas and Louisiana to the farms of the Midwest, the cities of the Northeast, and to the other places that would immediately be oil short because they are oil dependent.

You, Mr. Chairman with Senator Durenberger, in cosponsoring a preparedness bill, have been very much involved in this effort, and certainly recognize it as a real priority.

Along with protecting ourselves in the case of an emergency, we have to lock toward accelerating the transition away from oil as the longer term objective of national energy policy. At the present time more than 40 percent of our oil usage goes for what might be called nonessential uses, that is, uses for which something else can be used. The generation of electricity is a good case in point. Now we are using more than 1 million barrels a day to generate electricity. We really only need to use marginal amounts of oil for this purpose.

Senator ANDREWS. In the Ford administration some of us made the recommendation to him that we put into effect a regulation prohibiting the use of oil or natural gas in central station generating plants. We thought we were moving with it. They put it in as a tentative recommendation, but not an absolute.

Had we had an 18-month prohibition, I think we would have made a great deal of gain. Now we are back where they are beginning to reinstall oil, and reinstall natural gas, and we are losing.

Dr. BERGMAN. I think in the case of oil that you are right. We need to continue to build incentives into the system and remove the obstacles, as you were discussing earlier, in creating a cost benefit analysis in terms of regulatory requirements that now prevent the fuel switching.

In the case of natural gas, it appears that we have turned the corner, and we may have sufficient natural gas, at least to use in the dual use facilities.

Senator ANDREWS. But with the price of natural gas going up, 3 or 4 years from now it will vitally affect agriculture, as we talked about a few minutes ago. That is not too good either.

We had problems when the environmental changes came in. We put stacks on the coal-fired generating plants, but many of the engineers got out their slide rules and computers and figured it would be cheaper to tear out the coal-firing mechanism and shift to oil or natural gas, which they did.

Now we have to find a way to make it economically desirable for them to shift back because of the long term best interest.

Dr. BERGMAN. That is certainly correct. I heard last weekend of an old plant, an old electric generating plant, that had been forced to switch from coal back to oil. Now the management would like to switch back to coal; it cannot afford it because the facility would be classified as a new plant, and under the new source requirements, would be required to buy equipment to remove 90 percent of the emissions. It is cheaper for them to stick with oil, but this is not in the national interest.

I think what you envision here makes a lot of sense. Electricity certainly is a high ticket item in displacing oil. It is a technology that we know how to use. We can use domestic fuel, coal, nuclear energy, to generate it. So the national energy policy and the national energy priority have to be directed toward reducing that nonessential oil usage as much as possible.

In terms of numbers, what we are really looking at is pretty small. If somehow we could reduce the oil consumption in the United States, say, by another 5 million barrels a day, we would be removing the discretionary amount of oil with which the OPEC nations now can manipulate the markets. We would reduce their discretion to zero.

Senator ANDREWS. Quite candidly we would get ourselves out from under the possibility of being blackmailed or blackjacked into going along with a lot of problems that could lead to other hostilities. If we get into a gun fight trying to protect our access to Middle East oil, it is going to cost us a lot more than any amount that would be spent in developing alternate fuel supplies in this country or setting up conservation programs or insulating every household in the country.

I think our friends in Great Britain are finding that out at the Falkland Islands.

Dr. BERGMAN. Yes. This is precisely why, despite the fact that all of us like the free market like we like green trees and motherhood, the free market alone cannot help us solve these national security problems.

The fine invisible hand sometimes gives us signals that are inconsistent with national interest signals. For example, in the case of synthetic fuels, the fine invisible hand told Exxon that it would be profitable for the Exxon shareholders to stop the largest synthetic fuel venture in the country. From the corporate standpoint, this made absolute sense.

But there is another aspect to this decision, and that is the national security standpoint and requires the assertion of the national security interest. This is the assertion that every barrel of imported oil has a security premium attached to it that the Government has to continue to introduce into any energy pricing equation. This is why we would encourage you and Senator Durenberger, who discussed this dimension when he was here, and the others who have taken a nonideological problem-solving stance on this issue to continue asserting the public interest and the Government responsibility in energy policy.

We want to cooperate with you, Senator, and help you in any way that we can.

Senator ANDREWS. Thank you very much.

Let me run one question by you. You mentioned Exxon and the fact it might be in the interest of the stockholders to stop that venture, but not in the interest of the Nation as a whole. Obviously the board of directors has to do what is in the best interest of the stockholders, the way corporate boards work. You cannot change that. You do not want to.

But if the Federal Government were to support part of the overall energy act that we worked for, and that passed the House, we would tell the synfuel people you build the plant, and we will pay you *x* number of cents per thousand Btu's produced. They would then know that they would have a floor.

If the capriciousness of the OPEC country lowered the price, and we could set a guaranteed base price, we would not put a premium on mismanagement or anything else. There is no grant or no guarantee. They would have to produce that energy at that price. That price could well be in the neighborhood of what we have had to pay in the last year or two for the OPEC oil. That would then be in the best interest of this Nation.

It would then give the incentive to the private sector or to the cooperatives, whichever, to develop alternate energy sources. Is this the type of program your organization would support?

Dr. BERGMAN. Right. It probably would be a bargain for the country if some of these organizations involved in synthetic fuels were given a guaranteed market for their product, such as the arrangement between Union Oil Co. and the Defense Department.

Senator ANDREWS. Or the arrangement we have when there is a price support program on milk. We have a dependable supply of milk at a fair price. We have a dependable supply of wheat at not so fair a price. We would like to have it a little higher.

If they set the price of energy in the Btu's at a fair price—the price we are now paying for imported oil—then the company that produced the alternate forms of energy in this country under that type of a contract would have to produce. They would be protected against the capriciousness of the world market over which they have no control. They would have to show themselves worthy by putting their systems together and building their plant and doing it at that price.

It is the old story of a contract bid, which we have run in our free enterprise system for a very long time.

Dr. BERGMAN. That is right. The offset to it is the enormous amount of money that we are now contemplating for things like the Rapid Deployment Force and the add-on to the defense budget required for protection of remote oilfields.

Senator ANDREWS. It makes you shudder. Thank you very much. My apologies for the bell ringing.

Dr. BERGMAN. Thank you.

Senator ANDREWS. Thank you very much for your testimony, and we have to vote.

[Recess.]

Senator ANDREWS. The subcommittee will come back to order at this time.

Our next witness will be Mr. Thomas Van Arsdall, vice president for energy resources, National Council of Farmer Cooperatives. Welcome to the subcommittee. We appreciate your taking the time to appear, and your statement will be included in the record.[1]

STATEMENT OF THOMAS VAN ARSDALL, VICE PRESIDENT, NATIONAL COUNCIL OF FARMER COOPERATIVES

Mr. VAN ARSDALL. As you know, the vote that you just took on S. 2332 was very important to us.

Senator ANDREWS. Our side won by 10 votes.

Mr. VAN ARSDALL. I am pleased to hear that.

A couple of years ago the Iranian shortage got our attention again. The 2-year glut that followed gave us, we believe, a valuable opportunity to take some positive steps so we would not get hit so hard the next time a shortage came along.

Well, the figures show now that the oil glut is over; 120 million barrels have been depleted from our national inventory of crude oil products in the last 6 months. The inventories, both in the petroleum industry and in the user community, have dropped to the minimum level that is allowable for normal operations to continue. Beyond that, logistical problems occur even during normal times.

Senator ANDREWS. There are shortages in North Dakota and in the upper Midwest States.

Mr. VAN ARSDALL. I heard you and Senator Durenberger comparing notes on the situations in your two States a little while ago. Our co-op managers across the country are telling me that is the rule rather than the exception in most of the Farm Belt, the Dakotas, Minnesota, Illinois, Iowa, Arkansas, Missouri, Nebraska, and Kansas. In many cases major terminals have been out of diesel fuel and gasoline for a number of weeks. They had to truck it in. This has all occurred without a disruption.

This reveals again how tenuous that rural petroleum supply system is, particularly when you stress it with planting and other peak farm operations.

The inventory drawdown is an interesting story in itself. A major reason for the administration's veto of S. 1503 is that it would discourage inventories being held in private hands. They viewed S. 1503 as a "bailout," a guarantee that users would not have to deal with their own supply problems.

Yet much of the big inventory drawdown has occurred since the veto of S. 1503.

From the farmers' point of view, you know what kind of cost-price squeeze he is facing, and the cash flow problem and interest rates he is facing. These high rates mean it is costing him about 25 cents per year to store a gallon of diesel fuel on the farm. He cannot afford to do that, so he has been storing as little as he needs for the immediate future.

This moves back up the system with the jobbers and marketers, who are also hurting. They have the same kind of problems, as does the refining community. They have burned off these inventories as rapidly as they could to minimize interest costs

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[1] See p. 134 for the prepared statement of Mr. Van Arsdall.

So when the weather turned good, and in a broad part of the Farm Belt the product was not in place on the farm or close by, the logistics system could not move it out there. But I think we will "muddle through" somehow this spring, and the farmers will get their crops in.

This inventory behavior is a reasonable reaction by these people to the economic circumstances. Their immediate problem is survival, economic survival, given what they are facing.

It is not the knowledge of an omnipresent but uncertain threat of disruption motivating their inventory decisions. Once the disruption is 2 years old, it goes back pretty far into the mind of the decisionmaker.

I think it is useful to look at how well we spent these past 2 years, in terms of buying time to improve our energy policy stance. Where do we stand?

We have done some good things. The private sector has done a lot of conserving in response to the sharp rise in energy prices. The strategic petroleum reserve last year was filled at exceptionally high rates by the Reagan administration. We would like to commend the administration for that action.

The decontrol of the consistent overregulation of the petroleum industry has eliminated many shackels. Unfortunately in throwing out the bad, it seems the administration also has endeavored to throw out what we perceive as the good.

As you know, you worked many hard months on S. 1503. You took the initial lead on that activity, in fact, before this very subcommittee. That careful process, in spite of overwhelming votes in both Houses resulted in a veto.

In the meantime, the Department of Energy officials seemed to have shown an aversion to emergency preparedness planning, even under existing authorities. They spent most of their time working against S. 1503.

The strategic petroleum reserve drawdown plan—how you use that oil once you have it in place—is so general that all the hard decisions that will be necessary to move that oil, refine it, and get it to the farmer and other consumers has been postponed. Our only alternative at present is to make those decisions in the midst of a crisis with no leadtime, and believe me, as you know, that makes for bad policy implementation. It usually spawns hurried legislation that quite often overreacts.

I think the bottom line in a number of studies, including one from the General Accounting Office, shows that we wasted much of that valuable time that the temporary glut gave us.

This Nation is probably worse off in terms of its ability to deal with an oil disruption than it was before the Iranian revolution. That does not mean it is hopeless.

Positive steps can still be taken. The vote that you just took on making certain the strategic petroleum reserve is filled at a high rate is critical.

The other amendments that you have been working on with Senators McClure, Jackson, and Durenberger are critical in terms of moving forward within the constraints that the President has set.

Those amendments, do not provide pricing or allocation authorities, nor do they provide for an agricultural priority. That is bad. It is very disappointing. What they do provide, I think, is pretty meaningful. They require the administration to do some advanced planning under existing authorities.

It also mandates a strategic petroleum reserve drawdown plan. I understand a modification was made that would have the report due just after the election, which leaves me concerned about the intended quality of the drawdown plan. I understand the administration now will accept the SPR plan rather than fighting it.

A little known fact is that under the existing law that affects strategic petroleum reserve planning, the needs of agriculture and other priority uses are supposed to be considered.

Now, I know that the farmer cooperative community and agriculture far too many times have asked for your assistance. We would hope that you would use your office once more again to follow this legislation through to final passage, and then to keep a close eye on the administration's efforts to implement the mandate that Congress will have passed, to make certain the needs of agriculture are determined and considered adequately; to make certain if we do have farm fuel shortages and the marketplace is not adequately responding, there is an option to turn to.

In turning to a slightly different subject, the marketplace out there is changing. Demand is down quite sharpiy. Refinery utilization is down to about two-thirds of capacity, as opposed to a normal range of 85 to 90 percent. Similar conditions prevail in the cooperative refining system. Two refineries are being mothballed or shutdown. This is an attempt to utilize the remaining capacity at a higher rate, and to take one of the more efficient refineries and increase its capacity by one-third.

On the marketing and distribution side, they are agonizing over the best ways to respond to the farmer-owners' needs, looking to whether the present delivery system is adequate or if they have to go to increased bulk deliveries; whether propane is going to have a different profile in the market; and again keeping a close eye on alternative fuels.

There is a key issue involved in the budget process. I know that you, Senator, are joining with others in looking at ways to raise additional revenues to reduce the deficit. One of the alternatives, an obvious alternative, is to tax energy. I understand it is a definite feeling that energy will be taxed to the tune of at least $10 billion.

One alternative considered is a $5 import fee, which would raise in gross terms between $10 and $15 billion. The adverse impact, according to most studies, would far outweigh the positive effects of revenue generation.

The impact on farmers, the concentrated impact, would be to the tune of $1 billion for the petroleum fuel costs for farm operations alone. When you compare that to what little is left of net farm income, it could reduce net farm income by as much as 8 percent. Farmers certainly do not have the option to pass it on in the form of increased prices. They are under the free market more so than any other sector of the economy, at least domestically.

We hope if energy is taxed Congress will at least search for a more broadly based energy tax, so no one sector is hit inequitably.

Senator ANDREWS. One of the challenges you find in tax law, and I am not a member of the Finance Committee, is to make it equitable across this Nation. If you have an energy import fee or if you have a tax on all forms of energy, it is not equitable because it is not a matter of choice in many instances.

We talked a moment ago with the witness immediately preceding you about the unique problem that the dweller in rural America faces in getting to church, getting to the grocery store, and getting to the doctor vis-a-vis the person in the urban area.

The person in the urban area can get on mass transit subsidized by the Federal Government, as a way of saving energy. He can ride to the doctor, to the church, or whatever. In rural America they cannot.

Similarly, there can be energy conservation practiced by less use of an automobile, but you cannot do that when you plow an acre of ground. If you plow an acre of ground, that takes *x* number of Btu's of diesel fuel equipment.

So it is patently unfair to one sector of this Nation, that is, the farm sector because of the high energy use in order to produce the food energy largely from fuel energy.

Then you add another disparity. Anyone who lives in the Northern tier of States has to buy a lot more Btu fuel oil to heat their home than someone who lives in the Southern tier of States. Right now we have a Federal program, a home fuel subsidy, to try to take care of the increased cost of heating these homes. It is ridiculous for the Government to tax and add to the price, on the one hand, and then send out more and more subsidies, on the other.

They recognize this kind of a disparity. It would be my hope, and I would hope that your group and others would pass the word around the country that in the interest of equity, if we are trying to put a tax on fuel to encourage conservation and to raise revenue, to exempt some fuels from that tax.

You can do it equitably if you put it on those fuels that are now taxed. There is an exemption for home heating oil from the excise tax on fuel; there is an exemption for agricultural fuels from the excise tax on fuels that are used in automobiles; and these should remain. This is the way I would hope that we direct that type of tax, if a tax is necessary.

We need the help of your organization and many organizations to point out the fact that a tax on oil or any other energy across the board is not equitable because of the differences in need for energy consumption.

Mr. VAN ARSDALL. We certainly wholeheartedly agree with you, Senator. We have been talking with your staff and that of Senator Durenberger on such a proposal. I understand it may be forthcoming. We will look at it closely.

Senator ANDREWS. We have talked to the members of the Finance Committee about this. They have been responsive so far.

Mr. VAN ARSDALL. That is good news.

Senator ANDREWS. But not, shall we say, nailed down.

Mr. VAN ARSDALL. We will continue to work on this on a very high profile.

Now, just a closing thought, I guess, to end up my statement. Obviously the first priority for agriculture in terms of the energy is access to adequate fuel supplies when they need it and wherever they need it. However, I think we need to remember periodically that there is a continuing legacy. Until this spring we did not have fuel lines or shortages in agriculture.

We do have a continuing legacy that stays with us. When that disruption hit during the Iranian revolution and during the following year, oil prices went up 160 percent. During the 2-year glut, they came back down about 10 percent. It is a sort of rachet effect. It shows, I think, the impact of the cartel on the price in the marketplace, even though the event that caused the disruption was external to OPEC oil politics.

If you look at the increased prices which are staying with the farmer in terms of fuel costs, that translates into about a $5 billion fuel cost, above what farmers were paying before the Iranian revolution. When you compare that to a net farm income this year of between $13 and $18 billion, it shows you how devastating another oil shortage can be in terms of the impact on the farm and the entire economy, that is, if we are not able to respond to it in an effective fashion.

Mr. Chairman, I thank you for your continuing leadership in this area. Agriculture in the energy area certainly has no better or more effective friend.

Senator ANDREWS. You are kind to say that. I appreciate the statement you made. Also you have done a superior job in outlining agriculture's dependency on reliable and timely supplies of fuel of all kinds.

Tell me is there still an office or some people at the Department of Energy who monitor inventories as to their locations and the movement of petroleum products or with decontrol are we totally at the mercy of the weather or the market and supply fluctuations?

Mr. VAN ARSDALL. Some of my members in the petroleum business commented that they in the business have a poorer picture of the marketplace and circumstances than they ever did before because the Department of Energy, by and large, has stopped active monitoring of various circumstances.

Senator ANDREWS. So if the Secretary of Energy or if a Member of the Senate or the House picked up the telephone and called over there to find out where the fuel supplies are and what the situation was, he could not get that information?

Mr. VAN ARSDALL. I believe that is basically correct.

Senator ANDREWS. Are the State energy offices still functioning? They did a pretty good job working with my staff in the last disruption.

Mr. VAN ARSDALL. A number are not operating because budget cuts at the Federal level forced them to basically disband or be rendered ineffective.

Senator ANDREWS. They are not there to report in to the people at the Federal office if the people at the Federal office were still interested in this kind of information?

Mr. VAN ARSDALL. It varies from State to State.

Senator ANDREWS. We have nothing in place any longer like the special rule No. 9, which gave considerable authority and latitude to the Federal Government to allocate and assign priorities when a shortage occurred. Is that also correct?

Mr. Van Arsdall. That is correct.

Senator Andrews. Right now we are sitting out there rather naked and unprotected as far as any potential supply disruption is concerned?

Mr. Van Arsdall. During the spring of 1979 a rather prominent Department of Energy official responded when pressured about the farm fuel shortages, "Agriculture will just have to muddle through, I guess."

I am afraid that in terms of national policy that statement is painfully truer than ever before.

Senator Andrews. At that time we did have some ability to do something, even though that administration was not willing to do it. Now the new administration has dismantled the apparatus so that if they were inclined to do something or if something got serious enough so they realized they had to do something, they could not.

Mr. Van Arsdall. Now, Senator, you would have the luxury of legislating in a crisis, just to give them adequate authority to take action.

Senator Andrews. The luxury we are trying to put together for the American people is to get legislation through ahead of the crisis so we are not trying to put things together at the last minute.

With your help and the help of others who testified today and those who take a look at this record and pass the word out to the country, maybe we can get a better job done.

Thank you for coming today. Thanks for your help in the past.

Mr. Van Arsdall. Thank you.

Senator Andrews. That concludes the hearing for today. We appreciate your being here. We are adjourned.

[Whereupon, at 3:50 p.m., the subcommittee adjourned, subject to call of the Chair.]

APPENDIX

STATEMENT OF ROBERT D. PARTRIDGE, EXECUTIVE VICE PRESIDENT, NATIONAL RURAL ELECTRIC COOPERATIVE ASSOCIATION

Mr. Chairman and members of the subcommittee, my name is Robert D. Partridge. I am Executive Vice President of the National Rural Electric Cooperative Association, the national service organization of nearly 1,000 rural electric systems serving consumers in 46 states.

With your permission, Mr. Chairman, I would like to submit for the hearing record copies of several resolutions which were drafted and approved by the NRECA membership at our 40th Annual Meeting held earlier this year in Atlanta, Georgia. These resolutions express positions which the members of NRECA have taken on a number of important issues relating to the subject of this hearing, but which time does not allow me to cover in detail during my testimony this afternoon.

Before I address myself to the issue of energy equity for rural America, I would like to take just a moment to express to you, Mr. Chairman, and to the other members of this esteemed panel, the tremendous appreciation of NRECA and the entire rural electric program for your strong support during last year's struggle to maintain a viable and effective REA loan program.

This past year has seen the rural electric program—and in particular the REA financing system which has made the electrification of America's farms and ranches possible—come under the most severe assault it has faced in nearly a half-century of existence. Cutbacks and changes in the REA loan programs proposed by OMB last year and again this year would add millions of dollars to the energy costs of rural consumers without reducing the federal budget by a single penny.

You, and I'm happy to say, the majority of your colleagues in both Houses of Congress, stood by the REA program. You fought to preserve it at a time when it would have been politically much easier to go along with the major cuts and crippling changes that had been proposed for REA. With your help, the most important aspects of REA financing programs have survived and in some ways even been strenghtened.

And because of what you did last year, REA will be able to keep doing the job it was created by Congress to do nearly a half-century ago—a job that will continue to need doing for as long as it's a goal of this nation that all Americans, rural and urban alike, should have a reasonably equal opportunity to lead safe, healthful and productive lives. The availability of adequate, reliable and affordable supplies of electric energy is, I firmly believe, a vital ingredient in reaching that goal of rural-urban equity.

We who work in the rural electric program pledge our continued best efforts in making use of REA and the other tools you have given us—tools which continue to make it possible for rural electric systems across the nation to keep the lights on and the power flowing to the more than 25-million Americans we serve.

To turn now to the purpose of this hearing, let me first congratulate this Subcommittee for calling these important hearings to examine the precarious energy balance in U.S. agriculture and the nation's energy policies as they pertain to rural areas. We have high hopes that this inquiry will help awaken this nation to the absolute necessity for energy independence, and our need for a national energy policy that addresses fairly and equitably the needs of rural Americans and farmers who are highly dependent upon petroleum products, especially during critical planting and harvesting periods.

To lead off, I would like to spend the next few minutes outlining some of our very serious concerns about the Administration's continuing efforts to weaken and reduce the REA financing program. We feel this subject matter relates very directly to the overall focus of this hearing.

We believe strongly that electricity has become the "backbone" of the entire system of rural energy. America's rural electric systems serve most of the nation's farmers and ranchers, and a strong rural electrification program which adequately maintains the technical and financial integrity of our rural electric systems through continued upgrading, maintenance and construction of distribution and power delivery facilities, is absolutely essential to the long-term ability of our nation's farmers and ranchers to produce food and fiber for our country's urban citizens and for the rest of the world.

And, without an adequate and fairly administered REA program, we believe there is no hope that rural people will ever achieve an equal footing with the rest of America in terms of either energy supply or cost.

In the Administration's fiscal 1983 proposals for the REA loan program, however, we sadly once again find an array of cuts and changes that would weaken the rural electric program substantially, and add very significantly to the power costs being borne by the people of rural America.

For the REA insured loan program, which provides the bulk of the capital needs of the local distribution systems providing service to 25-million rural citizens in some of the most sparsely populated and difficult-to-serve areas of the nation, the fiscal year 1983 budget proposal seeks a reduction of nearly 40 percent from the ceiling amount authorized by Congress for this year. For the loan guarantees which have made it possible for rural electrics to make vital gains in their power supply self-reliance, the Administration calls for a cut of almost 30 percent from the presently authorized level.

To justify these reductions, Administration spokesmen have continued to portray rural consumers' rates as being lower than those being charged by other utilities—a remarkable assertion in light of the fact that the REA Administrator himself said precisely the opposite in an appearance he made before the House Agriculture Committee's Ad Hoc Subcommittee on the Budget just a few months ago.

NRECA studies have demonstrated—using the government's own data—that the sad truth is simply the mirror-image of that assertion. Rural people are, unfortunately, already paying an average of 12 percent more for their electric power needs than are non-rural consumers in the same region of the country. And reducing the availability or increasing the cost of REA loan funds would, without doubt, widen that rate gap.

The Administration is also doggedly sticking to its insistence that the rural electric loan program is in some way an unfair burden on the American taxpayer. In point of fact, REA does not directly utilize a single tax dollar for its loans. Other than funds needed to cover salaries and administrative expenses of the REA staff, there are no appropriated moneys involved in financing rural electric systems, and the REA programs operate totally outside of the federal budget.

There is, however, one new wrinkle in the arguments being used by the Administration to justify gutting the REA loan program. I'm referring to an incredible statement found on page 202 of the OMB's "Major Themes and Additional Budget Details" book, published in conjunction with the fiscal 1983 proposed budget. Under the heading of "Effects of the Proposed Change," the OMB says, in essence, that higher rates for rural consumers are "reasonable" because of the—and I quote again—"relative cost of providing service in less densely-populated areas."

It appears that OMB's position is that the people of rural America should logically expect to pay more for the electric power they need, simply because they have chosen to live in rual areas. The implication seems clear: If you don't like—or can't afford—to pay exhorbitant rates for electric power, then you'd better start thinking about moving to the city. But for farmers, ranchers and others, whose tap-roots are set deep into the soil of rural America, no other alternaitve is suggested.

Frankly, the Administration's continuing opposition to REA and the rural electric program has many of us baffled. Administration spokesmen applaud the 1981 Economic Recovery Tax Act which provided private power companies more than $1-billion a year in new tax concessions. When this legislation is combined with previously enacted tax breaks, investor-owned power companies as a group are being forgiven virtually all of their federal income tax obligation—amounting to some 4-billion dollars per year in subsidy to help them meet capital needs.

We have no quarrel with, and in fact we support, the assistance which has been provided to the investor-owned utilities. Their problems in raising capital have been most severe in recent years.

But rural electric systems have capital shortage problems of their own which are even more severe. Instead of a helping hand, rural electrics are being asked to pay even more for capital they must have to operate. Where is the justice—or even the logic, for that matter—in increasing the aid given to one segment of an industry while simultaneously penalizing another?

In addition to our continuing concerns about proposed reductions in the overall availability of REA loan funds, we also are very much alarmed by a number of major policy and procedure changes which have been, or in some cases are apparently about to be, proposed by the agency. Prominent among these are changes reportedly being considered which would abruptly and significantly increase the degree of outside or "supplemental" financing which borrowers must acquire in conjunction with their REA loans.

Other recent policy shifts arbitrarily exclude certain types of facilities and equipment from the use of REA financing. Included in this prohibition are headquarters facilities and other several types of general utility plant and equipment. We believe strongly that all of these facilities are integral parts of the borrower's utility system, and do not agree that separate and distinct categories should be established for the financing of various components of that system.

We also have seen a distinct shift in REA's administrative policies pertaining to the loan guarantee program. We are deeply troubled by an increasing number of situations in which REA has insisted that certain portions of major projects—pollution control equipment on a generating plant, for example—be financed separately and without use of the REA guarantee.

We are particularly disturbed by the fact that REA is attempting to apply these "proposals" for policy changes in a retroactive manner, and has required that numerous pending loan applications be amended to remove funds for headquarters or changed in other ways to conform with the new policies.

I also would call your attention to what we see as some glaring inconsistencies in several REA policies and practices, such as their frequent reluctance to grant reasonable requests for lien accommodations and their continuing suggestion that the REA guarantee should be applied to only some fixed percentage of a loan. Through these actions REA is, in effect, making it more difficult—if not impossible—for even the most financially strong borrowers to exercise non-REA financing options. Given the fact that the Administration has stated many times that one of its goals is to "wean" REA borrowers from their longstanding reliance on federal credit, it would seem logical to expect that REA should be taking actions to make this transition easier—not harder.

Finally, I would call to your attention the fact that the time required for REA to process a typical insured loan application has now reached an average of six months. This kind of delay, which we believe is largely unnecessary and due at least in part to the fact that REA is operating very substantially under its authorized personnel ceiling, makes it necessary for many borrowers to acquire short-term loans at extremely high interest, needlessly adding to the rates their consumers must pay.

I honestly cannot see what penalizing the rural electric program and needlessly adding to the economic burden of rural electric co-op consumers has to do with meeting the economic goals of the Administration. I know of no investment which has had a greater positive impact on our economy as a whole than the increased agricultural productivity made possible by rural electrification. These credit needs are being met without the use of a single tax dollar for REA loans.

The continuing assault on the REA loan programs is, I believe, just one of many ways in which this Administration has made it clear that the needs of rural America are very low on its list of priorities. The experience of the past year has led many rural electric program leaders—including a substantial number who have been strong supporters of President Reagan—to conclude that there is a serious and pervasive lack of understanding and regard for the people of rural America among the policy-makers of this Administration.

The needless demands for sacrifice being placed on rural electrification are also being imposed on many other vital rural and farm programs. The Administration, for example, has proposed that Farmers Home Administration programs for housing and economic development be drastically cut—some of them to the vanishing point—while interest rates on rural water and sewer systems are tripled.

And all this is going on, as the members of this panel well know, at a time when record numbers of farmers and ranchers across the nation are being driven into bankruptcy. Farm income this year is expected to plummet to about $15-billion, less than half what it was three years ago. Farm debt now stands at more than $200-billion, an increase of two-and-a-half times in just five years. Interest payments on farm debt alone are almost equal to net farm income.

Thousands upon thousands of family farms will be no longer in existence by the end of the decade. I know that you have all seen the disheartening statistics published time-and-time-again which show the rapid decline of family farms.

The grim statistics predict a dark future for our farmers and ranchers. This forecast, however, could be made considerably brighter through the development and implementation of a strong rural energy policy, built on a foundation which includes an adequate, reliable and affordable supply of electric power for all of rural America.

With the most recent oil glut, we may well succumb to energy complacency and lose the hard-earned progress in both supplemental energy sources and in energy conservation. Now is the time to solidify the gains we have made, and get a firm handle on viable alternatives for imported oil. We must be prepared to make sure that our continued dependence on high-priced overseas petroleum does not stifle the economic recovery so vital to the survival of rural America.

At the same time, any new look at electricity's role in the total energy picture should not result in the abandonment of other energy alternatives to the use of oil. Rural electric systems throughout the nation are leading the way in finding alternatives to the use of irreplaceable fossil fuels for the generation of electric power. NRECA members systems are deeply involved in a multitude of research projects in which, for example, sunflower seed hulls are being used to fire boilers in the Dakotas, compressed air is being stored for use in generating power in peak load periods in the Midwest, and wind, geothermal and hydro energy is being harnessed throughout the country.

We must continue to seek ever better ways to make use of these alternative methods for generating electricity—however, I must emphasize that we must, and will, continue to look to the use of our domestic coal and uranium resources for the bulk of our power in the foreseeable future.

The beauty of electricity is that it can be produced by a wide variety of resources in which our nation is richly endowed. And because electric energy is the most versatile and easily transportable form of energy available, it can quickly be put to work to replace imported petroleum in a number of key areas, for example home heating and cooling, and to a lesser extent, short range transportation.

The replacement of oil with electricity ultimately could reduce petroleum usage in the U.S. by as much as 35 percent from current levels. This, it seems obvious, is most assuredly a goal we must pursue.

Mr. Chairman, in closing, I would again like to extend our great appreciation to you and the members of this panel for your continuing support and efforts toward maintaining a viable rural electrification program. If there are any questions which you or the committee members may have at this time, I would be pleased to answer them to the best of my ability.

Thank you.

[The following material was submitted by Mr. Partridge, National Rural Electric Cooperative Association:]

From: Legislative Committee.
Approved by: Resolutions Committee.
Subject: Equity and fairness in Federal treatment.

Extensive studies have documented that the level of federal assistance to the investor-owned utilities and publicly-owned utilities substantially exceeds that extended to rural electric cooperatives. The new provisions of the Economic Recovery Tax Act of 1981 increases the federal assistance to the investor-owned utilities by another $1 billion annually.

We believe that it is particularly inappropriate and inequitable for the Administration to expand federal assistance to the investor-owned utilities while it simultaneously proposes to drastically reduce the REA insured and guaranteed loan levels. This is especially unfair to the rural consumers whose contribution to the entire economy is critical.

We urge the Administration and the Congress to eliminate the disparity in federal assistance to electric utilities by preserving its support for the rural electrification program.

From: Legislative Committee.
Approved by: Resolutions Committee.
Subject: Financing.

Rural electric cooperatives can meet their responsibilities only if they are able to obtain an adequate volume of capital. There consumer members, in turn, must have fully adequate electric service in order to produce the food and other essentials for a growing nation and its vital foreign trade. Such production combats inflation and contributes toward national self-sufficiency in the supply of energy which is essential to full employment, national security and many other aspects of the general welfare.

We commend the Congress for authorizing an adequate insured loan program of $850-1,100-million for fiscal year 1982. Data provided by the NRECA Loan Fund Survey indicated that the insured loan demand for fiscal 1982 will exceed $1,100-million. An authorization for fiscal year 1983 of REA insured funds of not less than $850-million nor more than $1,100-million reflects minimum required levels and is entirely consistent with the national objective of reducing inflation and exercising fiscal restraint and responsibility.

We urge the Administration to utilize the full amount of loan authority provided by the Congress and approve loans consistent with the ceiling level. We urge maintenance to the current ratios between REA and concurrent loans. We oppose any effort to deny G&T systems their legal eligibility for insured loans.

From: Legislative Committee.
Approved by: Resolutions Committee.
Subject: Guaranteed loan program.

Public Law 93-92 provides REA with the authority to guarantee loans. These loans are estimated to be about $5 billion during the current fiscal year, or about 85 percent of the total REA loan program. The REA loan guarantees are uniquely advantageous in providing financing for essential power supply facilities for rural consumers without incurring any costs whatsoever to the government.

We urge the Administration to rescind its stated policy of severely limiting REA loan guarantees. We further urge the Congress to legislatively ensure that adequate financing will be made available for power supply facilities, such as by establishing a "floor" on REA loan guarantees.

We oppose any unjustified increases in FFB interest rates and any reduction in the guarantee to some arbitrary percent of the loan requirements.

From: Legislative Committee.
Approved by: Resolutions Committee.
Subject: Federal Financing Bank.

The Federal Financing Bank (FFB) has served to coordinate and facilitate government credit activities in an efficient and advantageous manner. It should be continued without change.

FFB funding of REA loan guarantees is mutually beneficial to the government and to the borrower. The borrower saves a substantial 150 basis points in interest costs and FFB makes about $6-million on each year's guarantee program.

We commend the Congress for mandating the availability of the FFB funding of REA loan guarantees. We oppose any effort to restrict the FFB participation.

From: Legislative Committee.
Approved by: Resolutions Committee.
Subject: Off-budget Federal programs.

We note with some concern the ever-increasing amount of legislation that is being introduced in Congress which would place the Rural Electrification and Telephone Revolving Fund, the Rural Telephone Bank, the Federal Financing Bank and other federal programs in the federal budget.

Since our loan programs have no budgetary authority, require no budgetary outlays and therefore have no impact at all on the budget, we strongly oppose any effort by Congress or any federal agency to place those programs in the federal budget.

From: Legislative Committee.
Approved by: Resolutions Committee.
Subject: REA financing of transmission lines.

It was clearly established by Congress in 1973, that all distribution systems would have available for long-term capital needs, REA insured loans for transmissions facilities.

Once again in language adopted in 1981, Congress has made its intent clear that REA should immediately process all distribution loan applications now pending at REA which contain transmission facilities. REA has announced that some distribution systems will no longer be eligible for REA insured loan funds for transmission facilities.

Transmission facilities are an integral part of an electric system and must be built if rural electric systems are to continue to provide adequate and reliable service. Clearly it is the consumer who will suffer if rural electric systems are forced to acquire high-cost capital to finance the construction of these needed facilities.

We therefore urge that the Rural Electrification Administration adhere to the expressed intent of the Rural Electrification Act of 1936, as amended, and supply the necessary funds to provide for the construction of needed transmission lines and substations, as well as the distribution facilities for rural America.

From: Legislative Committee.
Approved by: Resolutions Committee.
Subject: The REA revolving fund.

Since the passage of Public Law 93-32 on May 11, 1973, all REA insured loans have been made from the special off-budget Rural Electric and Telephone Revolving Fund. The revolving fund receives no appropriations whatsoever, but relies instead solely on collections of interest and principal on outstanding loans and on the sale of certificates of beneficial ownership (CBOs) to fund all new loans.

Concern has been expressed regarding the increased differential between REA's interest rate on CBOs and its lending rate, and that this gap may eventually deplete the revolving fund. The overall condition of the fund remains excellent; the ratio between its lending and borrowing is a favorable 4.4 to 1, and its interest income is double its interest expense. However, the increased interest obligations incurred in each of the last several fiscal years represents a valid concern.

We do not believe that any changes to the revolving fund, such as reducing loan levels or increasing REA interest rates, are currently warranted. Instead, we call upon the NRECA economics staff to continue to monitor the condition of the revolving fund and make periodic reports of their findings, so that recommendations for constructive change may be developed as necessary and appropriate.

From: Community and Economic Development Committee.
Approved by: Resolutions Committee.
Subject: Rural housing.

In the mid-1950's, Farmers Home Administration became a major source of financing for rural housing and since then has assisted hundreds of thousands of rural families to acquire decent housing.

Notwithstanding the impressive accomplishment FmHA has achieved and the benefits rendered to so many rural Americans, many of whom are members of rural electric cooperatives, rural areas still contain a disproportionate share of the nation's substandard housing—about 1.9 million units.

The severe cuts which the Office of Management and Budget have proposed—a reduction from $3.7 billion this year to $1.1-billion next year—would permit FmHA to provide little more than a token housing program leaving a vacuum that could not be filled by the few mortgage-lending institutions that serve rural areas. Moreover, these cuts, if implemented, would virtually halt construction of rental units for low-income families including the elderly.

We have long supported FmHA's housing program and deplore OMB's efforts to decimate it. We urge the Administration and Congress to fund this important program at least at the current year's level.

From: Legislative Committee.
Approved by: Resolutions Committee.
Subject: REA supplemental loan requirements.

REA recently has published a notice of its intent to revise certain aspects of the supplemental loan requirements which have been attached to its insured program since 1973. While specific changes have not yet been proposed, it appears likely that an effort will be made to increase the percentage of non-REA funds some borrowers will be required to utilize, and/or to substantially revise the criteria used to determine the supplemental ratio to be applied to each borrower.

Based on NRECA's most recent loan fund survey, however, it appears evident that the demand for loan funds in the foreseeable future can be fully met under the present supplemental ratios, but only if REA makes full use of the loan levels authorized by Congress, which presently are set at $850-million to $1.1-billion for the current fiscal year. We believe further that the existing criteria for establishing supplemental loan requirements, which is based on the borrower's Plant Revenue Ratio (PRR), has worked well and equitably over the years, and that no workable alternative has yet been developed which would be superior to the PRR approach. Special consideration should be provided to systems serving fewer than two consumers per mile of line.

For these reasons, we strongly oppose any change in the supplemental loan ratios which could require any REA borrower to obtain more than the present maximum of 30 percent of their loan funds from non-REA sources. We call attention to the fact that an increase in these ratios would accomplish nothing more than to increase financing costs for individual borrowers—an increase that is especially untimely since most cooperative's rates already are substantially higher than those of neighboring non-REA-financed utilities.

We further believe that the present PRR-based criteria for supplemental loan requirements should be retained as presently established.

Finally, we urge in the strongest possible terms that REA be allowed to make full use of the loan amounts authorized by the Congress in this and in subsequent fiscal years.

From: Community and Economic Development Committee.
Approved by: Resolutions Committee.
Subject: Office of Management and Budget proposals for rural development.

Despite increasing unemployment and underemployment in rural areas, the Office of Management and Budget has proposed massive cutbacks next year in rural development programs of the Farmers Home Administration. These programs help create thousands of private sector jobs as well as provide modern community facilities.

In regard to FmHA's business and industrial development loan program, OMB proposes to eliminate it entirely in fiscal 1983. This would shut off one of the few sources of capital for small businesses in rural areas. In addition, OMB would substantially reduce loan levels for water/sewer and drastically reduce housing loans from $3.7-billion to $1.1-billion. These levels are millions of dollars under those of 1982 and represent loan authority for which the funds come from the private market, either as insured or guaranteed loans. They do not represent government appropriations and therefore have very little impact on the federal budget.

We would remind the OMB Of the recommendation adopted by the NRECA membership at its annual meeting last year; namely, "Notwithstanding the fact that agriculture continues to be a major underpinning of the rural economy, it no longer can supply most of the jobs. From the standpoint of dealing with the problem of high unemployment and preventing the resumption of rural outmigration, existing rural development authorities can be of great significance mainly in the form of loans at little or no cost to the government."

We strongly oppose these OMB proposals and urge the Administration to adequately fund these rural develoment programs which, we believe, can assist the Administration in fulfilling its campaign promises to create more jobs for rural people and to further the well-being of rural America.

[The following exhibits were submitted by Mr. Grahl. See p. 27 for the oral testimony of Mr. Grahl.]

EXHIBITS

Exhibit 1, map of Basin Electric member service areas;[1] Exhibit 2, McKenzie Rural Electric kilowatt hours sales chart; Exhibit 3, article from Rural Nebraskan; Exhibit 4, listing of Federal legislation and executive orders affecting energy development; Exhibit 5, listing of Federal, State and local permits required for Antelope Valley Station; Exhibit 6, Basin Electric lead time chart for development of Antelope Valley Station; and Exhibit 7, Basin Electric editorial on Clean Air Act from North Dakota Rural Electric Magazine.

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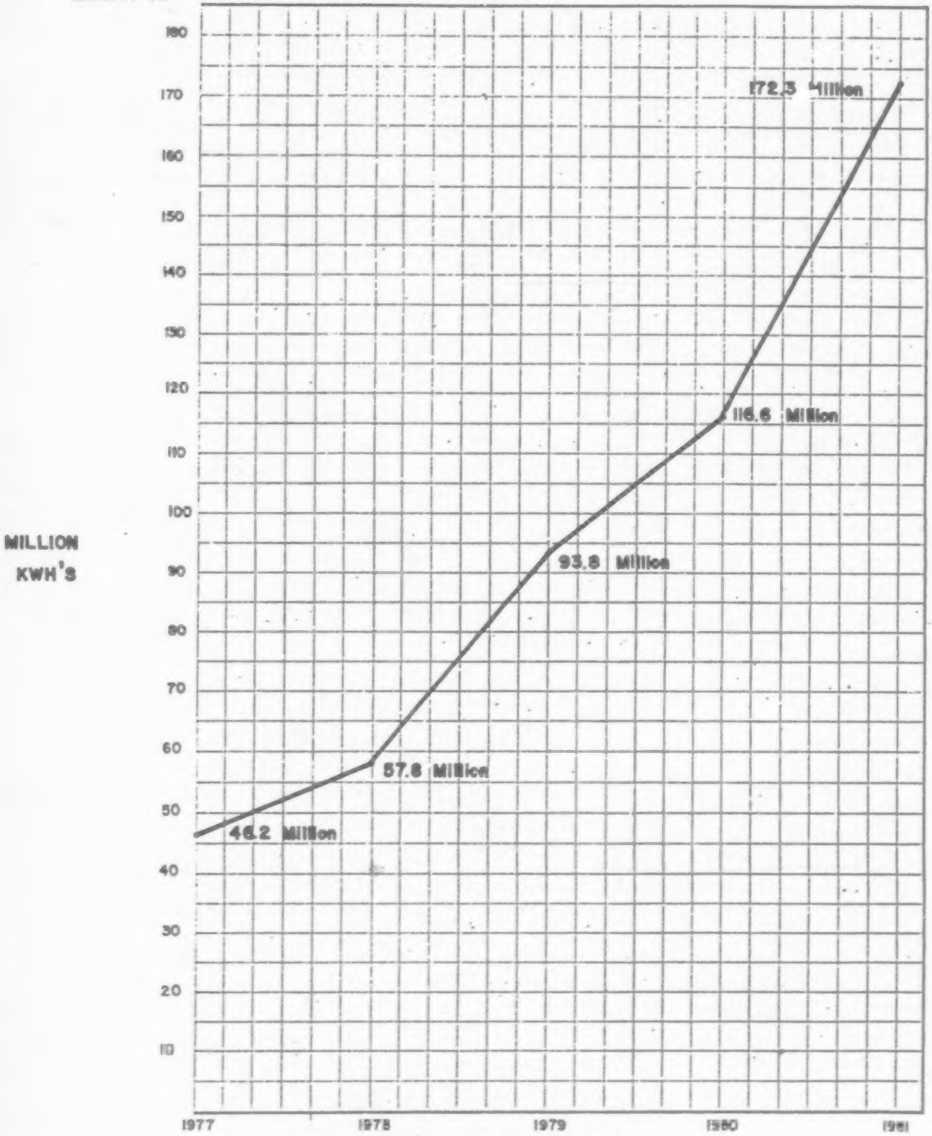
[1] This exhibit cannot be reproduced for the hearing record.

EXHIBIT #2



KILOWATT-HOUR SALES
McKENZIE ELECTRIC COOPERATIVE, INC.

EXHIBIT 3

[REPRINT FROM RURAL ELECTRIC NEBRASKAN, APRIL 1982]

STUDY FORECASTS INCREASE IN DEMAND FOR ELECTRICITY

A study by the Bureau of Business Research at the University of Nebraska estimates that the growth in demand for electrical power by consumers will jump dramatically during the next eight years.

"Market demand for electricity within the state is forecast to increase from around 14 billion kilowatt hours in 1980 to 34.7 billion kilowatt hours in 1990," says Clifford P. Dobitz, research associate of the University of Nebraska.

Irrigation will be leading the increase in demand for electrical power with a 13 percent jump in demand, says the study. Following will be industry, expected to be up by 11 percent, commercial at 9 percent and residential at 8 percent.

Commercial and residential use of electricity is expected to drop, according to the study. It forecasts a drop of from 29.9 percent now to 28.8 percent by 1990. Dobitz predicts that residential consumption will go down from 39.3 percent to 34.2 percent of the total.

The growth in electrical power used for irrigation has climbed steadily since 1960 when Nebraska farmers used 45 million kilowatt hours for various irrigation pumps. By the end of 1970, consumption had reached 235 million kilowatt hours, a big jump of 422 percent.

By 1980, irrigators were using 610 million kilowatt hours, a rise of some 1,256 percent during the 20 year period.

The number of electrically powered pumps rose during those 20 years from 6,790 in 1960 to 22,835 in 1980. This is expected to rise to around 74,602 by 1990.

In 1980, electrically powered pumps were being used on about 35 percent of the state's irrigation systems. Diesel was being used in 32 percent, propane 12 percent, natural gas 20 percent and gasoline 1 percent.

Prices paid for electricity by Nebraskans over the study period were favorable for growth. In 1980, though prices have gone up, the average residential cost per kilowatt hour in this state was about 19 percent less than the national average. Nebraskans average about 4.64¢ per kilowatt hour, compared with a national average of 5.36¢.

EXHIBIT 4

FEDERAL ENVIRONMENTAL LEGISLATION AND EXECUTIVE ORDERS AFFECTING ENERGY DEVELOPMENT

GENERAL

The National Environmental Policy Act and final regulations (Code of Federal Regulations, Vol. 43, No. 230, 55978-56007).

Executive Order 11514, Environmental Quality.

Executive Order 11523, National Industrial Pollution Control Council.

Environmental Quality Improvement Act of 1970.

Executive Order 12088, Federal Compliance.

Reorganization Plan No. 3 of 1970 (which created the Environmental Protection Agency).

Executive Order 11738, Administration of the Clean Air Act and the Federal Water Pollution Control Act with respect to federal contracts, grants or loans.

Executive Order 11988, Floodplain Management.

Executive Order 11989, Off-Road Vehicles on Public Lands.

Executive Order 11990, Protection of Wetlands.

Executive Order 12044, Improving Government Regulations.

AIR

Clean Air Act.

Excerpt relating to Clean Air Act from National Energy Conservation Policy Act.

Energy Supply and Environmental Coordination Act of 1974.

SOLIDS

Resource Conservation and Recovery Act of 1976.

WATER

Federal Water Pollution Control Act.

Executive Order 11735, Delegating Functions of the President under Section 311 of the Federal Water Pollution Control Act, as amended.

The Rivers and Harbors Act of 1899 (The Refuse Act).

Executive Order 11574, Refuse Act Permits.

General instructions, short forms, standard forms, and a discharge monitoring report for applications for permit discharges under the national pollutant discharge elimination system.

Water Resources Planning Act.

Fish and Wildlife Coordination Act.

Safe Drinking Water Act.

NOISE

Noise Control Act of 1972.

PESTICIDES

Federal Insecticide, Fungicide and Rodenticide Act.

LAND USE

Surface Mining Control and Reclamation Act of 1977.

Coastal Zone Management Act of 1972.

Land Policy and Management Act of 1976.

USDA Soil Conservation Service memorandum on prime farmlands.

CONSERVATION

Wilderness Act of 1964.

Endangered Species Act of 1973.

National Forest Management Act.

Forest and Rangeland Renewable Resources Act of 1974.

Executive Order 11870 on Animal Control on Federal Lands.

Mineral Leasing Act.

Wild and Scenic Rivers Act.

Soil and Water Resources Conservation Act of 1977.

Historic Preservation Act.

Historic Sites, Building and Antiquities Act.

CHEMICALS

Toxic Substances Control Act.

EXHIBIT 5.—BASIN ELECTRIC POWER COOPERATIVE—ANTELOPE VALLEY STATION—PRECONSTRUCTION PERMIT REQUIREMENTS

Granting agency	Description	Approval date
1. North Dakota State Water Commission	Permit to appropriate and divert water (19,000 acre-feet) from the State of North Dakota.	May 24, 1975
2. North Dakota State Water Commission	North Dakota water rights contract	Nov. 30, 1976
3. North Dakota State Water Commission	Appropriate groundwater for industrial use	July 8, 1977
4. Mercer County Board of County Commissioners	Conditional use for an electric power generating plant	Sept. 13, 1977
5. North Dakota State Department of Health	Construction solid waste disposal	Oct. 19, 1977
6. Mercer County Board of County Commissioners	Close section line between sections 13 and 24, T145N, R88W, in Mercer County	Nov. 2, 1977
7. Federal Aviation Administration	Twin concrete chimneys—determination of no hazard to air navigation.	Nov. 11, 1977
8. North Dakota Public Service Commission	ANG-Corridor compatibility for proposed water transmission pipleline from a point in Renner Bay to ANG (certificate of site compatibility No. 9).	Nov. 9, 1977
9. North Dakota Public Service Commission	Certificate of site compatibility for a coal gasification plant–ANG.	Do
10. North Dakota Public Service Commission	Certificate of corridor compatibility for blowdown pipeline corridor.	Nov. 30, 1977

EXHIBIT 5.—BASIN ELECTRIC POWER COOPERATIVE—ANTELOPE VALLEY STATION—PRECONSTRUCTION PERMIT REQUIREMENTS—Continued

Granting agency	Description	Approval date
11. North Dakota Public Service Commission	Certificate of site compatibility for an energy conversion facility certificate 3.	Nov. 30, 1977
12. North Dakota State Water Commission	Drainage permit	Jan. 27, 1978
13. North Dakota State Department of Health	Permit to construct	Feb. 23, 1978
14. Mercer County Board of County Commissioners	Certificate of zoning compliance	Mar. 8, 1978
15. Mercer County Board of County Commissioners	Temporary use permit for storage facilities and temporary offices.	Mar. 15, 1978
16. North Dakota State Water Commission	Ash scrubber makeup water pond construction	Apr. 6, 1978
17. North Dakota State Water Commission	Coal runoff pond construction	Do.
18. North Dakota State Water Commission	High quality water holding pond construction	Do.
19. North Dakota State Water Commission	North construction runoff pond construction	Do.
20. North Dakota State Water Commission	South construction runoff pond construction	Do.
21. North Dakota Public Service Commission	Certificate of corridor compatibility—2 345 KV transmission lines between AVS/LO, 1 345/500 Kv transmission line between AVS/BEPC substation near Huron, S. Dak.	Apr. 10, 1978
22. Mercer County Board of County Commissioners	Conditional use—blowdown pipeline	May 2, 1978
23. Mercer County Board of County Commissioners	Conditional use for a water pumping station	Do.
24. Mercer County Board of County Commissioners	Conditional use for railroad trackage	Do.
25. Rural Electrification Administration	AVS final environmental impact statement unit 1; also unit 2.	May 12, 1978
26. North Dakota State Water Commission	Permit to divert and appropriate water from the Knife River for the north/south construction runoff ponds; also the coal pile runoff pond.	June 1, 1978
27. Corps of Engineers—Omaha District	Easement for right-of-way for construction/installation/maintenance of a water supply line, pump house, access road.	June 8, 1978
28. Corps of Engineers—Omaha District	License to use/occupy government lands on Garrison Dam/Lake Sakakawea in the construction of a water supply line, pumphouse, access road.	Do.
29. Corps of Engineers—Omaha District	Permit to construct a raw water intake structure consisting of a pump station, vertical pump shaft, tunnel and inlet works, and miscellaneous site permit.	July 21, 1978
30. Corps of Engineers—Omaha District	Easement for a right-of-way for the construction/operation/maintenance of a blowdown pipeline and discharge structure.	Oct. 25, 1978
31. Corps of Engineers—Omaha District	Use land on Lake Sakakawea for a work area in conjunction with easement No. DACW 45-2-78-6127.	Do.
32. North Dakota Public Service Commission	Route permit in connection with the proposed blowdown line from AVS to Lake Sakakawea.	Jan. 1, 1979
33. North Dakota Public Service Commission	Route permit No. 17 to construct a raw water supply line and associated facilities from ANG to Lake Sakakawea.	Do.
34. North Dakota State Department of Health	Radioactive materials license	Jan. 19, 1979
35. Mercer County Board of County Commissioners	Intake water pipeline—transmission facility	Feb. 6, 1979
36. North Dakota Public Service Commission	Permit for construction of a transmission facility No. 20—2-345KV lines from AVS to LO; also 1-345/500 KV line from AVS to proposed substation near Huron, S. Dak.	Feb. 12, 1979
37. Federal Aviation Administratrion	Notice of proposed construction or alteration—500 KV transmission line.	Feb. 16, 1979
38. Mercer County Board of County Commissioners	Conditional use for AVS transmission lines	Mar. 6, 1979
39. Mercer County Board of County Commissioners	Temporary use permit for air monitoring site No. 2 NE 1/4-1-144-88.	Do.
40. Mercer County Board of County Commissioners	Temporary use permit for air monitoring site No. 3 NW 1/4-23-143-88.	Do.
41. Mercer County Board of County Commissioners	Temporary use permit for air monitoring station No. 5 SW 1/4-34-146-88.	Do.

EXHIBIT 5.—BASIN ELECTRIC POWER COOPERATIVE—ANTELOPE VALLEY STATION—PRECONSTRUCTION PERMIT REQUIREMENTS—Continued

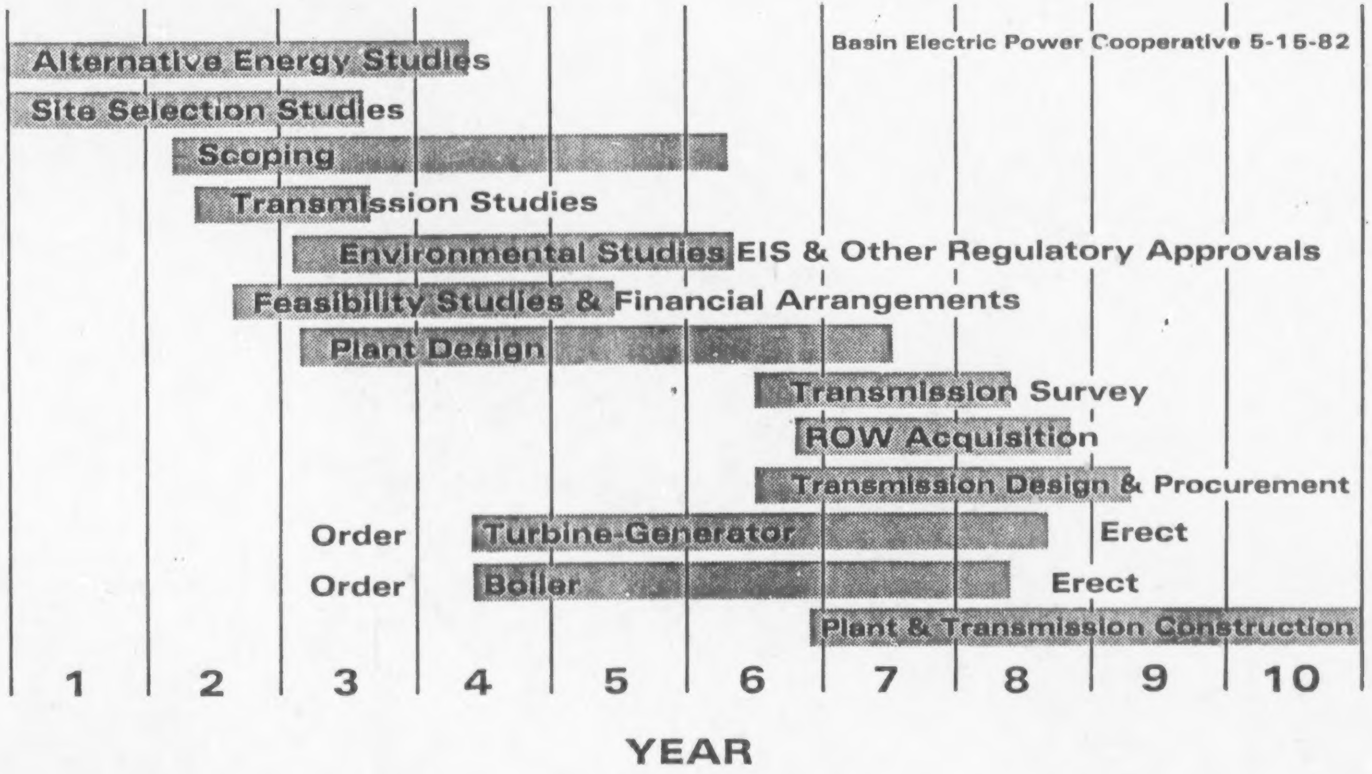
Granting agency	Description	Approval date
42. Mercer County Board of County Commissioners	Temporary use permit for air monitoring site No. 1 NW 1/4-31-145-88.	Mar. 6, 1979
43. North Dakota Public Service Commission	Transfer from ANG to BEPC of certificate of corridor compatibility No. 9 and permit No. 17.	Apr. 9, 1979
44. Beadle Electric Cooperative	License for erection/maintenance of 8 transmission line crossings.	Apr. 16, 1979
45. U.S. Fish/Wildlife Service	Right-of-way permit for construction of transmission line crossing Beadle and Hand Counties, S. Dak.	May 2, 1979
46. North Dakota State Water Commission	East raw water storage reservoir construction	May 5, 1979
47. North Dakota State Water Commission	West raw water storage reservoir construction	May 15, 1979
48. U.S. Fish/Wildlife Service	Right-of-way permit for construction of a transmission line crossing Campbell, Faulk, Edmunds, and Walworth Counties.	June 1, 1979
49. Oliver County Board of County Commissioners	Temporary use permit for air monitoring site No. 4 SE 1/4-18-143-86.	June 5, 1979
50. Federal Aviation Administration	Notice of proposed construction or alteration—building to house the steam generator and associated equipment for each unit.	June 15, 1979
51. North Dakota Public Service Commission	Partial assignment to BEPC of NDPSC certificate of site compatibility No. 2 issued to ANG.	July 27, 1979
52. North Dakota State Highway Department	Transmission line crossing Interstate Highway 94 east of Glen Ullin, N. Dak.	Aug. 7, 1979
53. North Dakota State Highway Department	Transmission line crossing State Highways 200, 49, 6, 1806, 13 near Zap, Glen Ullin, St. Anthony, Fort Rice, and Linton, N. Dak.	Do.
54. North Dakota State Water Commission	Evaporation pond construction	Sept. 1, 1979
55. Campbell County Commissioners	Permit to construct 16 access approaches to BEPC transmission line.	Oct. 2, 1979
56. U.S. Fish/Wildlife Service	Right-of-way permit for construction of a transmission line crossing Emmons County.	Nov. 14, 1979
57. North Dakota State Highway Department	Transmission line crossing State Highways 200, 31, 200A near Beulah, also Stanton, N. Dak.	Jan. 1, 1980
58. North Dakota State Highway Department	Transmission line crossing State Highways 200/200A near Stanton, N. Dak.	Do.
59. Corps of Engineers—Omaha District	Easement for a right-of-way for the construction/operation/maintenance/supervision of an overhead electric power transmission line.	Jan. 23, 1980
60. Morton County Engineer	Permit to build a road approach to microwave tower	Feb. 14, 1980
61. North Dakota State Highway Department	......do	Feb. 21, 1980
62. Corps of Engineers—Omaha District	Permit to dredge/place permanent fill material in the Missouri river in conjunction with the construction of an electric transmission line crossing/tower.	Apr. 3, 1980
63. Federal Aviation Administration	Notice of proposed construction or alteration—40 ft microwave self support tower near Beulah, N. Dak.	May 30, 1980
64. Federal Aviation Administration	Notice of proposed construction or alteration—220 ft guyed tower near Alpena, S. Dak.	June 13, 1980
65. Federal Aviation Administration	Notice of proposed construction or alteration—100 ft guyed microwave tower near New Salem, N. Dak.	Do.
66. Federal Aviation Administration	Notice of proposed construction or alteration—180 ft microwave tower near Glen Ullin, N. Dak.	Do.
67. Federal Aviation Administration	Notice of proposed construction or alteration—30 ft microwave tower near Beaulah, N. Dak.	Do.
68. Federal Aviation Administration	Notice of proposed construction or alteration—160 ft microwave tower near Broadland, S. Dak.	June 23, 1980
69. Federal Aviation Administration	Notice of proposed construction or alteration—120 ft microwave tower near Broadland, S. Dak.	Do.
70. Board of Equalization—Beadle County, S. Dak	Building permit for approach to microwave tower—Cavour.	Aug. 1, 1980
71. Board of Equalization—Beadle County S. Dak	Building permit for microwave tower	Do.
72. Board of Equalization—Beadle County, S. Dak	......do	Do.

EXHIBIT 5.—BASIN ELECTRIC POWER COOPERATIVE—ANTELOPE VALLEY STATION—PRECONSTRUCTION PERMIT REQUIREMENTS—Continued

Granting agency	Description	Approval date
73. Federal Aviation Administration	Notice of proposed construction or alteration—190 ft guyed microwave tower near Cavour.	Aug. 27, 1980
74. North Dakota State Water Commission	Water appropriation for goundwater wells	Sept. 30, 1980
75. Federal Aviation Administration	Notice of proposed construction or alteration—345 KV transmission line, line 134.	Nov. 5, 1980
76. Federal Aviation Administration	Notice of proposed construction or alteration—345 KV transmission line, line 128.	Do.
77. Federal Aviation Administration	Notice of proposed construction or alteration—345 KV transmission line, line 127.	Nov. 5, 1980
78. Mercer County Board of County Commissioners	Conditional use for solid waste landfill center	Apr. 10, 1981
79. Economic Regulatory Administration	Auxiliary boiler reclassification	May 18, 1981
80. North Dakota State Department of Health	Special use disposal facility (residue)	Oct. 8, 1981
81. North Dakota State Department of Health	Radioactive materials license	Jan. 8, 1982

EXHIBIT #6

LEAD TIMES REQUIRED FOR MAJOR ELECTRICAL GENERATING FACILITY



Basin Electric Power Cooperative 5-15-82

EXHIBIT 7

[Reprint from North Dakota Rural Electric Magazine]

THE CLEAN AIR ACT: "GINNED UP" NUMBERS COSTLY FOR REC'S

(By Duane Bye)

The Clean Air Act is currently up for review and reauthorization by the Congress of the United States. Congress has heard testimony ranging from that of environmental organizations urging no changes in the Act to certain industry groups urging massive revisions. In between, Congress is hearing from the National Commission on Air Quality and such recognized authorities as the National Academy of Science, both suggesting changes that would make the Act more cost effective.

The final reauthorization of the Act will directly affect the cost and availability of electric power for the rural electric cooperatives (RECs) of North Dakota. The removal of certain arbitrary numbers from the Prevention of Significant Deterioration (PSD) Section of the Act could save rural consumers hundreds of millions of dollars while still maintaining the high quality air that we enjoy now.

Proposed modifications to the law will not affect the provisions necessary for health and welfare protection, or the preservation of air quality that allows for the continued enjoyment of our national parks and wilderness areas.

Rural electric and other organizations supporting these modifications include: the North and South Dakota, Nebraska, Wyoming and Montana Statewide REC associations; Midwest Electric Consumers Association; the American Public Power Association; and the National Rural Electric Cooperative Association, as well as Basin Electric Power Cooperative. These organizations have not called for major changes in existing legislation. Proposed modifications are for the removal of the short-term PSD Class I 24-hour and three-hour increments for sulfur dioxide, and the 4-hour increment for total suspended particulates. These values are completely arbitrary, without scientific basis, and were placed in the Clean Air Act in 1977 without public discussion or debate.

The arbitrary nature of these increments was confirmed in October of 1981 when the U.S. House of Representatives subcommittee on Health and the Environment heard testimony from Dr. John Middleton, representing the National Academy of Science. Dr. Middleton, asked to explain the basis for these short term values, said, "The increment is something somebody ginned up somewhere. They can be reginned if you want to."

These, then, are numbers upon which decisions involving hundreds of millions of dollars are based. For example, if because of these "ginned up" numbers Basin Electric is not permitted to build a third unit at the Antelope Valley Station, it will cost the rural electric consumers in North Dakota and this region over 300 million dollars more in capital costs to build at the next least expensive alternative location.

North Dakota Senator Quentin Burdick, as a member of the Senate Environment and Public Works Committee, is working with other members of the committee and the rural electrics to modify only these arbitrary aspects of the Clean Air Act so that the people of North Dakota won't have to pay the price for "ginned up" numbers.

The repeal of the short-term PSD increments will not have an adverse effect on the health and welfare of people or their property. Health and welfare remains protected by state and federal ambient air quality standards. In addition, PSD Class I air quality areas, such as Theodore Roosevelt National Park, remain protected by the annual increment limiting sulfur dioxide and total suspended particulates in any Class I area. These increments established for Class I areas afford protection to those areas that greatly exceeds the standards established to protect public health and welfare.

Basin Electric and its membership have since the formation of the cooperative in 1961 been concerned with the protection and preservation of the environment. For example, Basin Electric required mined-land reclamation of its coal supplier in the early 1960s, well ahead of state and federal legislation requiring such activities.

In 1980, Basin Electric received an award from the President's Council on Environmental Quality for "outstanding leadership in the application of advanced technology and significant contribution to the nation's environment." This award recognized the development of improved technology for the removal of sulfur dioxide from power plant stack gases.

Basin Electric and its member system RECs remain committed to the protection of the environment while developing long-term reliable and economical power supplies for their rural consumer owners. The proposed modifications to the Clean Air Act are in keeping with that grassroots philosophy.

STATEMENT OF SHERWOOD H. SMITH, JR., CHAIRMAN OF THE BOARD, PRESIDENT AND CHIEF EXECUTIVE OFFICER, CAROLINA POWER & LIGHT CO.

Mr. Chairman and Members of the Subcommittee, my name is Sherwood H. Smith, Jr. I am Chairman of the Board, President and Chief Executive Officer of Carolina Power & Light Company. My company provides electric service in a 30,000 square-mile area that includes about half of North Carolina and one-fourth of South Carolina, with a population of more than three million. Largely rural in nature, our service area is experiencing industrial growth which has brought about a desirable balance between industry and agriculture.

Carolina Power & Light Company (CP&L) built the first large-scale commercial nuclear unit in the Southeast, and it has operated safely and economically for more than 11 years. In 1975, we also built the first nuclear power plant in North Carolina. It has two reactor units. At this time we are constructing another two-unit nuclear plant in North Carolina as well as a two-unit coal-burning plant. This continues our commitment to a generation mix primarily based on nuclear and coal-fired generation. Like many utilities, we face the enormous challenge of financing the capital expansion needed to meet the growing energy needs of our service area.

In addition to representing CP&L, I testify today on behalf of the American Nuclear Energy Council (ANEC), of which I serve as Chairman of the Board. ANEC represents more than 100 organizations throughout the nation having an interest in nuclear power.

My purpose in being here today is to address briefly the long-term electricity supply problem facing our nation and the implications that it has for all segments of our society, including the rural communities. It is fitting that national energy policies be considered in the context of rural development because agriculture and agribusiness are highly dependent on an adequate supply of energy. A reliable energy supply at relatively low prices has helped make possible the tremendous production increases on our farmland in recent decades and is an integral part of the growing, processing, transportation and preparation of food for our nation and much of the world.

Electricity has been assuming an increasingly important share of the nation's total energy picture. Electricity represented about 15 percent of total U.S. energy usage in 1950, 25 percent in 1970 and 33 percent in 1980. Most analysts foresee that general trend continuing, with electricity accounting for 40 to 50 percent of total energy by the year 2000, as electricity is substituted for scarce and expensive fossil fuels and as it is applied to new uses.

Adequate and reasonably priced electricity will contribute to increased productivity, decreased unit labor costs, decreased price of our exports, and decreased overall costs of production. Our dangerous national dependence on imported oil can be reduced by replacing oil with the domestic resources of coal and uranium in electric generation. Thrity-six percent of all electric generating capacity is oil- or gas-fired, equivalent to 2.6 million barrels of oil per day. Electricity can also be substituted for oil in a variety of applications ranging from home heating to mass transportation and large industrial processes.

In the post oil embargo period there has been a general uncoupling of the strong historical link between economic growth and total energy use. Significantly, however, there has been a remarkable consistency in the relationship between the economy, as measured by GNP, and electricity use. In fact, the electricity-GNP relationship has persisted throughout the post World War II period, including the turbulent years following the 1973–1974 oil embargo. Electricity usage is an inescapable part of economic expansion.

From 1950 to 1973, electricity demand in the U.S. grew at an annual rate of 7.8 percent, thus doubling about every decade. In some areas of the country, such as the part of the Southeast served by CP&L, annual electricity growth rates surpassed 10 percent in some years. This period was one of relatively healthy and balanced economic growth. From 1973 through 1981, electricity demand in the U.S. grew at an annual rate of 2.6 percent. This period was one of service-oriented, non-industrial and short-term speculative growth during which capital expansion faltered significantly. The growth rate in the CP&L service area has declined to around three percent.

In all likelihood, this close relationship between GNP growth and electricity will continue. The longer the planning horizon, the greater the uncertainty about projecting the rate of electricity growth. But it is clear that the future demands placed on electric utility systems in this country will be greatly dependent upon the level and type of economic activity we experience.

The Electric Power Research Institute (EPRI) has developed a realistic band of estimates for economic growth to the year 2000, ranging from 2 percent to 3 percent average annual growth. EPRI uses 2.5 percent average annual GNP growth as a basic reference point. This represents a continuation of low economic growth which satisfies only minimum social expectations. In human terms, this rate of economic expansion would only allow the real income of a worker in the future to match that of workers of the same age and education today. (The work force will be above 30 percent larger by the end of the century.) It's like a socio-economic holding pattern.

This 2.5 percent average annual GNP growth rate, according to EPRI projections, would require an average growth in electricity demand of approximately 3.3 percent per year for the remainder of the century. Meeting even this relatively low demand growth would require approximately one million megawatts (one billion kilowatts) of installed generating capacity in the year 2000. That is compared with about 615,000 megawatts at the end of 1980.

Under this low-growth scenario, officials of EPRI foresee potential kilowatt-hour shortages approaching 25 percent in the year 2000, even if the industry builds as much generating capacity in the 1990s as it plans to do in the 1980s (168,000 MW). If the industry does not find it financially possible or economically prudent to build as much new generating capacity in the 1990s, then the potential kilowatt-hour shortage would be higher. These projections assume ambitious conservation and loan management programs and improving system load factors, as well as the need to retire a significant number of existing generating units. The resurgence of nuclear reactor orders is a pivotal factor in the industry's ability to meet the growing demand for electricity. As you know, a pall of uncertainty shrouds the nuclear industry that will take Government action and financial improvement to lift. No new reactor orders have been made in this country since 1978, and none are likely to occur in the next several years. The current focus of electric utilities is on completing those nuclear units already under construction.

If economic-electricity growth fails to attain even this low rate of growth (2.5 percent to 3.3 percent), then the potential shortages would be less. Conversely, however, if President Reagan's economic recovery program succeeds, and the economy expands at a faster rate, the potential electricity shortfall looms larger and more severe.

Many variables affect electricity supply and demand, and all the cause and effect relationships are not known. Regional disparities in economic growth and generating reserve margins complicate the picture, for some areas of the nation already face reserve margins that are dangerously low. Precise numbers are not as important as the general trend, and the general trend raises the specter of future electric power supply problems in this country.

Electricity will not be able to fulfill its unique role in our state and national economies unless more generating plants are built. Faced with the economic and regulatory realities of today, however, utilities have retrenched, minimizing capital expenditures wherever possible. The immediate pressure on utility systems at present is not to build power plants but to rebuild financial strength. While some on Wall Street view reduced capital expansion programs as a healthy response and a preliminary step to economic recovery for the cash-strapped utilities, many others, both inside and outside the industry, are becoming seriously concerned about the long-term consequences to our national energy supply system and our entire economy.

There is an extremely disturbing trend of large electric generating plant deferrals and cancellations in this country. From 1975 through 1981, 88 coal and nuclear units were cancelled, representing approximately 85 million kilowatts of capacity. Thus far in 1982, seven additional nuclear units have already been cancelled and a significant number indefinitely delayed. If this cancelled capacity were available today, it would essentially replace all the oil consumed to generate electricity in this country. In the mid-1970s these cancellations and in-service delays were often due to the slackening growth in electricity demand. More and more, however, a fundamental cause of the construction cutbacks is the utilities' inability to finance the extremely high cost of new plant construction. Government licensing and other requirements along with inflation and record-high interest rates have contributed to this situation.

The cost of building power plants, both fossil and nuclear, has increased dramatically within the last decade. Nuclear construction presents special challenges because of the long lead times and the continual regulatory changes. My company, for example, brought a nuclear unit into service in 1971 at a cost of $126 per kilowatt of generating capacity. We then brought two nuclear units into service in the mid-1970s at an average cost of $479 per kilowatt. Our next nuclear unit is scheduled to begin service in 1985 at a per kilowatt cost of about $2,400. The cost of future units will be even higher.

A recently released report by the Department of Energy's Office of Policy, Planning & Analysis concludes that if these trends continue unchecked, electric power will be more costly and less available in the 1990s than it is today. "Continued utility financial problems, against a background of modest electricity demand growth, may cause a long-term shortfall in electricity supply. If power plants continue to be canceled and deferred as they have been recently, supply sufficiency could be at risk in much of the country as early as 1990. The reliability of service could be called into question, and the cost of electricity could increase substantially." (The Nation's Electric Future: Perspectives on the Issue of Electricity Supply Sufficiency, February 1982).

If we allow the nation as a whole or even certain regions to drift toward electricity shortages, then we will be faced with an enormous problem for which there is no quick and easy fix. Having to embark on crash programs to install oil-fired combustion turbines may provide some temporary capacity relief, but at a great cost, both in terms of added fuel expense and the increased threat to national security. It would demonstrate a clear failure to learn from the expensive energy lessons of the 1970s.

Harvard University researcher and economist Peter Navarro has said that the current construction slowdown jeopardizes the nation's chances for economic recovery. "The hard fact is," Navarro says, "that without corrective action, the supply of available electricity over the next decade will not be sufficient to support hope-for economic recovery." In this era of heightened concern about our nation's lagging productivity, we should exploit electricity's tremendous and unique potential for improving productive operations, whether in agribusiness, in manufacturing, or in the rapidly growing service and information sectors of our economy.

More aggressive and innovative programs for conservation and load management will improve our chances of coping successfully with the power demands of the future. This is an area of intense activity among utilities and rural electric cooperatives throughout the country. I know that at C.P. & L. we have turned some of our most creative and talented people loose on this matter, and we expect good results. We are depending on our intensified conservation and local management efforts to reduce our 1995 projected peak load by the equivalent of two large base load generating units. But even with the best results from conservation, we still face a serious capacity shortfall in the years ahead.

Slowing the tremendous cost escalation of utility capital projects is a major step needed to allow utilities to continue with even minimum construction programs. It would take a detailed analysis to quantify the cost added to plant construction—and ultimately to consumers' bills—by unnecessary regulatory delays. Certainly, a more disciplined and streamlined nuclear licensing process, however, could save hundreds of millions of dollars in capital costs. The current process is simply too long with too much uncertainty and invitation for delay at every step. Regulations should be reduced, consolidated and restricted to public safety issues. Mid-stream design changes resulting in costly backfits should be minimized. Orders for modifications should be issued with realistic priorities and timetables. Licensing legislation could give utilities more confidence that nuclear plants can be constructed and operated within a predictable and reasonable time and cost. Chairman Palladino of the Nuclear Regulatory Commission has pledged to make this a more realistic, workable process; and we support his efforts in this regard.

Comprehensive nuclear waste legislation is also urgently needed to enable nuclear power to fulfill its vast potential as an economic power source and as a stabilizing influence on utility rates. There is a strong desire on the part of the American public to complete the task of establishing a national nuclear waste policy. The recent passage of the Senate bill S. 1662 is an encouraging sign that the full necessary legislative action will finally be taken on this key nuclear issue. A sound, consistent Federal policy on nuclear waste will remove a major stumbling block to further nuclear development and will also improve public confidence in our nation's ability to handle nuclear energy responsibly.

The future electric power supply is also inextricably linked to the Federal budgetary process and national economic health. Lowering interest rates, while continuing the fight against inflation, would provide a more potent financial shot in the arm to utility construction programs than the combined benefits of the 1981 Economic Recovery Tax Act. Interest expenses are claiming an ever larger share of total utility construction costs. For large plants completed this decade, interest expenses alone are estimated to be about 40 percent of total building costs.

Unfortunately, the inescapable key to avoiding generating capacity shortfalls in the future is to have somewhat higher electricity rates in the short term to finance expansion. Raising rates is not a popular concept, but it must be faced squarely and honestly. Any objective assessment of utility rate regulation over the last decade would show that the results of regulation have not allowed utility rates to keep pace with rising costs. Rate-making procedures that rely on past costs have simply been inadequate to utilities properly in a period of rapidly rising costs. Until Federal and State regulatory commissions give more weight to the long-term perspective, construction of any large base-load generating plant will be an uphill struggle at best. At worst, units will continue to be canceled regardless of future need for power, and in the 1990s we will be forced as a society to accommodate our economy and lifestyles to electric energy scarcity. Also, while reducing dependency on foreign oil by coal and nuclear power may be a generally accepted objective, in practice many regulators do not allow utilities rates of return adequate to generate the required internal capital to accomplish this objective. The Federal Energy Regulatory Commission should take a leadership role and provide an example for state utility commissions by implementing measures that are in the long-term best interests of consumers and energy producers alike.

It should be recognized that regulation is influenced by public attitudes about electric utilities and about the need for sufficient electric power. We in the electric energy business must do more to build public understanding about why rates must increase and why an adequate supply of electricity is a basic requirement for economic growth, job creation, improved productivity and national security. The Federal Government could aid this effort significantly by supporting a positive public education program about the role of electricity in our society and about the actions necessary to assure an adequate long-term supply. Currently, there is an unrealistic public expectation of zero risk for power generation and only a vague appreciation for the potential of a shortfall in power supply and the consequences that would follow.

In summary, a complex web of financial, regulatory and political obstacles threatens the ability of the U.S. electric utility industry to meet the energy demands of the future. A prolonged continuation of present conditions could lead to chronic power shortages and a constrained national economy by the 1990s. How successfully we as a nation respond to this challenge will have a long-term effect on the strength of our nation and the quality of our society.

Thank you for allowing me to present this testimony, and I will be glad to respond to any questions you might have.

STATEMENT OF A. DENNY ELLERMAN, EXECUTIVE VICE PRESIDENT, NATIONAL COAL ASSOCIATION

Mr. chairman, I am A. Denny Ellerman, Executive Vice President of the National Coal Associaton. NCA is a trade association representing most of the country's major coal producers as well as other companies associated with the coal industry.

INTRODUCTION

Let me begin with the thoughts of William Jennings Bryan more than nine decades ago: "Burn down your cities and leave your farms," he said, "and your cities will spring up again as if by magic. But destroy our farms and grass will grow in the streets of every city of the country."

The coal industry believes, as William Jennings Bryan said, that the policies which serve the interests of the farmer and rural America are also policies which can serve all Americans. Assuring an ample supply of energy at reasonable cost through greater coal use is a policy in point.

Coal is already playing an important role as the fuel used to make electricity at lower costs for rural Americans and the farmer, and that trend must go on. No less important is coal's roles as a substitute for oil and natural gas—making these fuels more available at reasonable costs to farmers, who must have them to grow our food.

As you have said, Mr. Chairman, the interruption of energy—especially oil and gas—at certain times would imperil the food supply of the United States.

Coal's direct and indirect contribution to help achieve "rural energy equity" and the public policy changes needed to assure more coal use at reasonable prices are the subjects of my testimony. But before I discuss these issues, and bearing in mind the implications of what William Jennings Bryan said, I want talk about how coal can help to revive our nation's economic and industrial growth, which is essential to rural and city dwellers alike.

U.S. MUST USE ITS VAST COAL RESOURCES

We are living in a "new energy era." It's been triggered in part by the oil price shocks of the 1970s, but also ushered in by the shift from declining real energy prices to rising real energy prices.

The "new energy era" demands that the United States use its vast domestic coal resources wisely and effectively to fuel its own needs, and not just as a catalyst to spur economic growth, but also to protect our national security.

This energy policy is important, despite a temporary worldwide oil glut and hiatus in rising oil prices. Five years ago, the world also was swimming in a sea of oil, but before the decade was out oil prices went up 170 percent, sending economic shock waves across the shores of the world's free nations. It could happen again.

COAL EXPORTS

One sure way to improve our economy at home, to help our allies build their economies, and to help protect world energy supply and pricing stability—so necessary to the free world's political security—is to increase American coal exports.

American coal is quickly becoming the economic common denominator of the growing interdependence among the United States and its allies overseas. Our allies are looking to us for a steady supply of lower-cost coal energy to build economic growth and development.

Coal exports are adding billions of dollars to our balance of payments each year, and those exports will continue to increase as long as American coal is competitively priced in the international marketplace.

The same coal mine-to-market chain which can serve to keep coal prices competitive for Americans, can also serve the interests of our allies. The steps we take to preserve coal's competitive position in the United States also strengthens the United States' hand as a world energy leader.

ENERGY SUPPLY AND PRICING AND ECONOMIC GROWTH

Turning our attention to the home front, one of the keys to restoring confidence in our economy is to end the nagging doubts about energy pricing and supply.

New factories won't be built, existing ones won't be expanded—both creating new jobs—unless businessmen can make the proper economic decisions. Without the assurance of an ample supply of energy at reasonable cost, these decisions cannot be made, and jobs will not be created.

That's why government policies must promote the greater use of our most abundant energy resource, coal. For the so-called "energy crisis" isn't measured so much by how much energy the United States has on hand, but how we are using the energy at our command.

Oil and gas are used to fuel three-quarters of America's energy needs. There's no question that sooner or later these energy resources will be shorter in supply and higher in price. It's imperative that we husband these crucial energy resources for thousands of essential uses—in the factory, on the farm, and in homes.

While the United States continues to rely heavily on oil and natural gas—coal, the nation's most abundant energy resource—accounts for only about 20 percent of our total energy needs. Coal not only is abundant, it can be produced at relatively constant prices over long periods. In fact, coal production could easily double without any appreciable increase in real price, and the reasons are simple:

The United States' huge coal reserves are readily available, can be mined with established technology, and the competition is fierce among the more than 3,000 privately-owned coal companies vying for a share of the marketplace.

Increasing the use of coal, both here and abroad, not only reduces dependence on oil or natural gas but also and necessarily moderates the price of these competing fuels.

As a result, the essential characteristics of the coal industry, competition and production at stable real prices, means that all Americans will share in the benefits of increasing coal use whether or not they are immediately involved.

Coal also can be a critical element in improving productivity. By using more coal, and by taking full advantage of its stable prices, we can create a powerful force to keep production prices under control, and therefore promote economic growth.

RURAL ENERGY EQUITY

Let me turn to coal's advantages in helping to achieve "rural energy equity."

Coal already is playing an important role in delivering an ample supply of reasonably-priced electric energy to millions of rural Americans. According to the National Rural Electric Cooperative Association (NRECA), this year about 72 percent of all installed capacity by Rural Electric Cooperatives is coal-fired. This doesn't take into account the large amounts of coal-energy purchased by rural co-ops from other utilities for resale to consumers.

Rural cooperatives are increasingly relying on coal to lower electric costs for good reason. Rural Americans often are facing higher electric rates, because the electric systems serving rural areas are also facing high fixed operating and distribution costs.

Coal's value as a substitute for oil and gas is even more compelling on a national level. In 1981, about 2.7 million barrels of oil/gas equivalents each day were used to generate electricity. As coal replaces oil and gas for electric generation—where coal is most easily substituted—a more reliable supply of oil and natural gas is assured for uses where coal cannot substitute to run the machines on the farm and to ensure that rural Americans keep their mobility.

As coal replaces gas, this vital energy resource is in greater supply to make ammonia—used directly as a fertilizer to grow food, but also as the principal feedstock to manufacture nitrogen fertilizers.

However, the effectiveness of coal as a direct means of keeping electricity supply steady at reasonable cost and as a substitute for oil and gas is wholly dependent on maintaining the present cost advantage of coal.

In this, the coal industry shares a responsibility by continuing its efforts to increase mining productivity. But, while the coal industry continues to streamline its operations and to improve the skills of its workforce, the price and supply of coal is no less affected by governmental policies at the national level.

I want to identify some of these policies, for they are crucial to the long-term success of building a rational, reasonable, and workable energy policy, serving rural and urban Americans alike.

Among the most important are: Avoiding overregulation; building more competition into the fuels and transportation markets; and federal coal leasing policies. I will discuss each, and point out how they affect the price and supply of coal to rural Americans and farmers.

NATIONAL POLICY CHANGES

Mr. Chairman, the coal industry shares your deep concern about the effects of overregulation on the supply, production and pricing of energy. The coal industry has been vocal and persistent in bringing this problem to public attention, because our industry is affected by regulations all along the mine-to-market chain.

However, Mr. Chairman, I am not here to condemn the past. The coal industry is encouraged by the attitude of Congress and the Reagan Administration toward regulatory excesses—assuring that the American consumer is getting a dollar's worth of benefits from a dollar spent.

While some progress is being made, the coal industry believes that much more needs to be done to remove burdensome and unnecessary regulations, to increase competition in energy and transportation markets, and to guard against a repetition of overregulation.

A case in point is the Congress' consideration of acid rain legislation, which would renew the heavy regulatory pattern, even as most Members of Congress and the American people are demanding fewer controls and a reduction in the costs of all regulation.

I need not burden this committee with the particulars of the acid rain debate for they are familiar to you. But it's important to recall, that the acid rain legislation, if enacted, would heap billions of costs on consumers for new pollution control measures. This would be done without a proper understanding of the many scientific complexities of acid rain, and absent of any assurance that the controls that are proposed will have the slightest effect on acid precipitation.

One acid rain bill, introduced in the Senate, seeks to require a 50 percent reduction in sulfur dioxide emissions from electric powerplants in a 31-state area east of the Mississippi, but primarily affecting 10 mid-western states. DOE estimates that this legislation would cost electric utilities and ultimately consumers as much as $300 billion over the next three decades.

I don't believe we should be playing a guessing game with consumers money, especially when there's no question that these new controls will add significantly to the high cost of energy for millions of Americans—many of them who are living in rural areas. Instead, acid rain research must be accelerated.

NATURAL GAS DEREGULATION

Nor do we believe that the national interest is served by a policy which keeps natural gas prices at artificially-low levels. This prevents coal from competing fairly and equally in the fuels marketplace to the detriment of all consumers.

If coal is allowed to compete fairly in the energy marketplace with natural gas, we expect a further shift from natural gas to coal in electric utility markets, especially in the Southwest. This would follow the same patterns of coal substitution for oil in the Northeast to the benefit of those electric consumers.

Mr. Chairman, conversion from natural gas to coal is in the best long-term interests of achieving rural energy equity. As more coal replaces gas, more gas is assured for those processes which have no other energy substitutes.

Let me be clear about this point, Mr. Chairman, because I know it is of deep concern to you. The American farmer must—simply must—have an assured supply of natural gas to make the fertilizers which are essential to grow crops.

Mr. Chairman, there is a "higher use" for natural gas. And, one of those "higher uses" clearly is for the farmer's use. This is particularly true when electricity can be generated with coal at lower consumer costs than gas.

While the coal industry is no expert on the effects of natural gas deregulation on farmers, we defer to the American Farm Bureau. I am attaching a recent statement by the Bureau supporting natural gas deregulation.

In summary, the Bureau concludes, that while natural gas deregulation may drive up certain farm costs in the short term, over time there are likely to be more benefits—in increased gas production and increased conservation for example—for rural Americans and American farmers.

COAL TRANSPORTATION COMPETITION

Of equal concern to the coal industry are the rates charged for the transport of coal by the railroads. Our concern should be shared by all consumers, especially rural Americans.

Sixty-five percent of all coal produced in this country is moved by rail, and for 85 percent of that coal traffic there is no practical transportation alternative.

The Staggers Rail Act of 1980, which the coal industry strongly supported, provides the mechanism to keep "captive" coal rates in line. But recent Interstate Commerce Commission rulings are subverting the intent of Congress.

If these rulings stand, they could have negative consequences for consumers' pocketbooks. Without the protection of "captive" shippers, and armed with deregulation, the railroads are free to increase transportation rates.

Simply put, the Staggers Rail Act gave the railroads the freedom from regulations they needed to improve their financial health. But, now that the railroads are benefiting from deregulation, they also want to end "captive" shipper protection, and don't want any competition in the coal transportation market.

Granting coal pipelines the right of eminent domain is a sure way to stimulate needed competition with the railroads for coal markets. Legislation to grant the same eminent domain rights to pipelines as oil and gas pipelines and electric transmission lines is pending in Congress.

This legislation creates no new federal programs, involves no budgetary expenditures, and takes special pains to leave water rights issues to the states.

We recognize the legitimate concerns that you, Mr. Chairman, and other Senators have about the issues of scarce western water and the impact coal pipelines will have on this water.

We believe that S. 1844, as drafted, not only protects water resources, particularly in the West, but actually strengthens state prerogatives regarding the use of water by granting to each state considerably more protection to control allocation of water resources.

Both the Senate and House coal slurry bills prohibit the exercise of federal eminent domain authority for obtaining water. They also require that water rights must be obtained according to state substantive and procedural law and allow a state to set terms and conditions on the use of its water. And, very importantly, the bills prohibit the use of the interstate commerce clause to subvert any state water law or regulation.

If this legislation isn't passed, coal pipeline construction likely will remain mired in legal battles, and a sterling opportunity to infuse badly-needed competition into our coal transportation system will be lost.

Competition, Mr. Chairman, is the central issue. It's not a question of whether the railroads are capable of hauling the rapidly increasing coal traffic. It's protecting "captive shippers" and all consumers from transportation rate increases by the railroads when there is no transportation competition in the market.

Improvements in our inland waterway system also are urgently needed. Waterways are moving coal and other commodities to market at lower costs. But to keep the waterways' competitive edge new locks and dams must be built and existing facilities improved by cutting red tape and finding ways to finance new construction equitably.

The coal industry is on record in support of cost-sharing for lock and dam improvements, but policy changes are needed to make financing of improvements a reality.

In the same way, our harbors must be dredged to take advantage of the lower transportation costs made possible by using larger coal-carrying ships. These vessels can save as much as 40 percent on transportation of coal overseas, assuring that the United States remains competitive with other major coal exporting countries.

COAL LEASING

Finally, the United States has the coal to meet our energy needs for generations, but the supply must be available for future use. Long range plans don't deal with future decisions, but the future of present decisions.

That's why leasing of federal lands is so important. We are encouraged by the Department of Interior's steps to reopen federal coal lands and to streamline the coal-leasing process. But the Federal Coal Leasing Act Amendments still contain a number of inflexible and unnecessary provisions, which ultimately decrease the value and importance of federal coal, drive up costs and decrease federal and state revenues.

CONCLUSION

In conclusion, Mr. Chairman, allow me to reemphasize the coal industry's agreement with William Jennings Bryan's observation: What serves the interests of the farmer also can serve the interests of all Americans. In energy, rural America is best served by policies which avoid artificially inflated energy costs and which ensure adequate energy supplies, especially of those fuels in comparatively short supply. Such policies would:

Avoid unnecessary and unproductive regulatory requirements;
Encourage competition in the transportation of coal;
Ensure ready access to this nation's abundant coal reserves; and
End price controls over all energy supplies.

These policies promote the interests not only of rural America but also of coal. They are preeminently in the national interest.

[Attachment 1]

STATEMENT OF THE AMERICAN FARM BUREAU FEDERATION

We appreciate the opportunity to present the Farm Bureau's views on the deregulation of natural gas and its implications for agriculture.

The American Farm Bureau Federation is the largest general farm organization in the United States representing more than three million families in approximately 48 states and Puerto Rico. It is a voluntary, nongovernmental organization representing over 75 percent of the nation's commercial farms and ranches.

Farm Bureau energy policy for 1982 states:

"Bureaucratic interferences in the energy market should be eliminated . . . Government regulations and punitive taxes levied on energy producers only serve to make the United States more dependent on foreign nations to supply our energy needs. Congress should encourage capital investment for the development of domestic oil and gas exploration by the competitive enterprise system and deregulation."

Since 1954, the federal government has regulated wellhead gas prices at levels below competitive energy prices. This has overstimulated demand, understimulated supply, and led to an imbalance in the gas market. We believe that the free market system is the best allocator of energy resources and the best provider of incentives for energy development and conservation.

Natural gas is a basic energy source and a close substitute for other energy sources. In a free market, close energy substitutes will have close to equivalent prices in terms of units of energy. In January 1982, crude oil prices were about $34 per barrel. If natural gas had been priced equal to oil on an equivalent energy basis it would have averaged $6.20 per thousand cubic feet at the wellhead in January 1982. Federal government price controls have held the current average wellhead price at less than $2.00 per thousand cubic feet for several years.

By 1985, the average price of gas should rise to an energy equivalent price, though there may still be wide price spreads between gas categories. However, rising natural gas prices will also cause gas users to conserve gas and gas producers to increase exploration and supply. This will put downward pressure on gas prices. Barring unforeseen political events or technical developments, gas prices between $3.00 to $6.00 at the wellhead are not an unreasonable forecast.

Farm Bureau realizes that decontrol of natural gas prices will probably increase costs for farmers in the short run. The most noticeable impacts will be increases in the cost of nitrogen fertilizer, electricity rates, irrigation costs, crop drying costs, and heating costs. Over the long run substantial adjustments will be made in response to higher gas prices just as consumers, businessmen, and farmers have responded to higher petroleum prices.

As natural gas is decontrolled, the outcome will be similar to the outcome of a parallel action—the phased removal of price controls on crude oil. With price controls on crude oil completely eliminated in January 1981, and with consequent reliance on the market system for pricing, the nation has seen crude oil prices stabilized, and recently, actually falling. U.S. production has stabilized from its long decline and conservation has been encouraged.

The response to the increase in gas prices will come in many forms from the farm community:

1. More soil testing and analysis of fertilizer requirements for various crop alternatives. This will likely lead to more efficient use of nitrogen fertilizer and other fertilizers. There will be increased demand for technology that will enhance the efficient utilization of fertilizer;
2. Increased use of legume cover crops which produce nitrogen that can be used by succeeding crops;
3. Some reduction in irrigation and a search for techniques to improve irrigation efficiency;
4. Added insulation and weatherstripping to buildings heated with gas; and
5. Some switching to supplemental solar heat for low-temperature grain drying to replace natural gas or LP gas.

While none of the above adjustments alone will offset the expected price increase, when these alternatives are totaled a market price impact will certainly be realized.

Already, innovative farmers and researchers are continuing to increase production and decrease energy and fertilizer inputs.

A potato farmer in Idaho is using aerated drip-irrigation to cut his water, energy and fertilizer needs by half or more. His yield is double the countywide average. He has increased his percentage of No. 1 grade potatoes.

A cotton farmer in Arizona has 1,200 foot long rows of drip-irrigated cotton. He has managed to cut fertilizer and energy use by half, water use by two-thirds and increase yield by 33 percent.

Drip-irrigated corn in Delaware has been shown to require only half the fertilizer of conventional corn production methods which use dry broadcast fertilizer.

Three of the award winning ideas of the 1981 Farm Bureau Energy Idea Search involved use of supplemental solar heat for grain drying. Each of these systems made provisions for other ways to use the solar heat besides grain drying. One plan, used solar heat for heating the farm shop and alcohol still. A second idea included use of a portable collector into his new machine shed. He uses the extra heat for heating his machine ship and winter chemical storage. His savings on LP gas (which is largely derived from natural gas) will be about $2000 per year. A fourth award winning idea was a simple solar collector retrofit on a shop wall to cut gas bills for shop heat. This retrofit cost $300 and will save about $125 of gas a year.

Economic theory says anytime the price of a resource is kept below its market price, the resource will be used inefficiently. Agriculture uses approximately 6 percent of the natural gas consumed in the United States. The whole economy cannot be asked to contunue a burdensome and economically inefficient regulatory system for the private benefit of a few users.

Last year for the first time since the early 1960's, our proved resources of natural gas did not decline. As rising natural gas prices spur domestic production, the more plentiful supplies will tend to moderate price increases and reduce the importation of foreign energy. Ultimately, our whole economy will benefit from decontrol of natural gas.

In summary, decontrol of natural gas prices will not necessarily spell doom for agriculture. It will challenge the innovativeness of America's farmers and ranchers and encourage them to become more efficient and better managers.

NATIONAL COAL ASSOCIATION,
Washington, D.C., June 2, 1982.

Hon. MARK ANDREWS,
Chairman, Subcommittee on Rural Development, Oversight and Investigations, Committee on Agriculture, Nutrition, and Forestry, U.S. Senate, Washington, D.C.

DEAR MR. CHAIRMAN: I am writing to thank you for the opportunity to testify before you this week on Rural Energy Equity and also to respond to the following questions you asked of me regarding my statement:

Note: These questions were asked by Senator Andrews on pp. 44 and 46, respectively

Question. What is the current level of coal exports and the dollar value?

Answer. The following table shows the total steam coal exports and dollar values for the years 1980 and 1981 and the projected figures for the years 1985 and 1990:

	Tons (millions)	Value (billions)
Year:		
1980	90	$4.5
1981	110	5.8
1985 [1]	110	[2] 6.0
1990 [1]	138	[2] 7.0

[1] Most likely—NCA forecast.

[2] Steam-net breakdown as forecast by the NCA Economics Committee. Based on f.o.b. values end of 1981–82 dollars.

Question. Regarding the concern about the effects of over regulation on supply, please cite examples of regulations most unnecessary.

Answer. One of the best examples of over regulation is provided by implementation of the Surface Mining Control and Reclamation Act of 1977 (SMCRA) which extended Federal controls over the reclamation of surface and underground mining. I am attaching two documents which illustrate the point. The first is an index to the regulations applying to particular aspects of mining. Perusal of this document provides some idea of the sheer magnitude and complexity of the regulations. Of course, not all are onerous and many are necessary.

The second document, published in June 1980, addresses the onerous and unnecessary regulations. I would draw your attention both to the several specific instances discussed in detail there and to the coal industry's success in challenging those onerous and unrealistic regulations in the courts. I am happy to say, however, that the regulatory reforms undertaken by the Reagan Administration are making some progess in reducing the problem.

I hope that these answers adequately respond to your questions and please let me know if you need any additional information.

Thank you again and we would be pleased to participate in any future hearing that your subcommittee might hold on energy matters.

Sincerely,

A. DENNY ELLERMAN.

STATEMENT OF KENNETH L. MCFATE, PRESIDENT, NATIONAL FOOD AND ENERGY COUNCIL, INC.

Fifty years ago, about ten percent of America's farms had electricity. Draft animals pulled many of our field machines. Most chores were done by hand. There was no power for water pumps or grain elevators; and no electricity for cooling milk or for preparing family meals. Work was hard. Days were long. Much of the energy used to produce our food was lost when food spoiled due to a lack of refrigeration.

During the last fifty years, the U.S. population increased by about 97 million people; and during that time the productivity of America's farmers increased an average of 1.5 percent per year—a much greater increase than for other workers. Oil and gas were the energy resources that brought mobility, increased labor efficiency, greater timeliness, some comforts and more convenience to the farm and its hardworking families.

New technologies resulting from publicly supported agricultural research, farm mechanization, increased use of commercial fertilizers and a minimal number of regulations were coupled with low-cost energy to develop a food system in America that is the envy of the world. Productivity and change are dramatized by the fact that between 1945 and 1979, average U.S. corn yields increased from 34 to 109 bushels per acre. This, of course, required more energy.

As energy use grew, electricity gained a significant role in boosting agricultural production. Electricity transformed the quality of life on the farm. Its off-farm use became increasingly important to the processing, the preservation, the marketing and the final preparation of high quality nutritious food that we Americans depend upon. The average American farmer can now feed himself and over 75 other people. Consequently, today's American family is provided their high quality foods for about 17 percent of the average family paycheck. America's consumers have been and can continue to be the primary benefactors of the efficient and timely use of energy for farming and for the off-farm links of the food chain. But energy must be available when needed. How can its availability be assured?

POPULATION, ENERGY AND THE GENERAL PUBLIC

As the Bureau of the Census predicts an 80 million increase in the U.S. population over the next 50 years, agricultural leaders, and all thinking Americans, must become more aware of the critical interdependence of future energy supplies and future food supplies. Policymakers, educators, industry and other leaders can and must do more, together, to create a greater public understanding of the energy needs of the food system from which they benefit. Such a team thrust can do much to create the atmosphere and climate that will allow the nation's energy suppliers to assure food producers and processors adequate amounts of energy, on a timely basis, in the correct form, and at prices that will maintain a strong and viable national economy. Questions to be answered are: Will this understanding take place? Can a desirable atmophere and climate be generated? To what extent is government a part of the problem? Will there be changes? And how soon?

I believe that public understanding must be based upon valid, balanced, up-to-date information on the amounts and kinds of energy used, potential energy supplies for the future, and the energy-related impacts of agricultural research and education, upon the availability and cost of the food basket of today and tomorrow. Of equal importance is the urgent need for candid assessments of all direct and indirect costs associated with energy production and distribution. Such indirect costs include overregulation, regressive state or national policies toward active industry programs and the potentially drastic effects of energy supply disruptions at critical times of the year.

As policymakers desire to be, and must be, informed as steps are taken to chart a new course that requires public understanding, a summary review of a few key factors seems relevant.

ON-FARM ENERGY USE

With 1980 assets of $920 billion, farming accounts for about three percent (3 percent) of U.S. energy consumption. Of all farm energy consumed;

30 percent is used for conventional field work; 25 percent is used for transportation; 20 percent is used for crop irrigation; 12 percent is used for livestock, dairy and poultry production; 8 percent is used for crop drying; and 5 percent is used for miscellaneous operations.

Of that energy used on farms about 80 percent comes from petroleum. This means that, on the average, 800,000 barrels of oil are used each day to grow our food. If all of this oil was imported, we'd be paying other countries $25 million per day (about $9 billion per year) for fuels used on U.S. farms.

Less than one percent of the national's natural gas consumption is used directly by farm machines. But natural gas and liquid petroleum are important fuels for running irrigation machines, crop dryers and poultry production systems. About half the irrigation machines in Texas, New Mexico, Oklahoma and Kansas are powered by natural gas. They are an important part of food production. Natural gas is also used at many country elevators to dry locally-grown crops.

Crop drying and irrigation are also the heaviest users of LP gas on U.S. farms. One-half of the nation's shelled corn is dried with natural or LP gas. An assured supply of LP gas for drying corn and other crops allows for earlier harvest, larger yields per acre and a higher-quality product. In contrast to our system, a recent report notes that ⅕ of the grain harvest in the U.S.S.R. is lost due to late harvest or to rot; and ⅓ of their potato harvest is left to rot. Timely energy supplies can be of critical importance.

Electricity use of U.S. farms has increased over 90 times during the last half century. On average, electricity provides about 10 percent of all farm energy use. On farms in arid and semiarid regions, like the Pacific Northwest, Nebraska and a few other states, electrically powered irrigation systems often make electricity the most important energy source. In 1978, three-fifths (⅗) of on-farm electricity use was for crop irrigation. On many farms, crop irrigation is absolutely essential for economical crop yields and for making the most efficient, effective use of the energy previously expended for producing seed, for plowing, disking, planting and for the application of fertilizers, herbicides and pesticides. Timely water applications in the right amount benefits all.

The unique characteristics of electric energy must be recognized. While U.S. farmers have over 1.5 billion gallons of liquid fuel storage capacity, alternating current electricity cannot be stored. It must be used when generated. In effect, electricity producers provide the storage in "greater-than-normally-needed" capacities. But, food producers—and food consumers—expect a continuously available supply whenever they demand it. For the farmer, electricity is essential for preserving product quality, for meeting on-farm regulations, for moving materials, for cooling, for warming, for human safety and for maintaining animal and poultry life. Whenever an automatic control calls for its use, it must be there. People need not, and usually do not, worry about how full or how near empty the "fuel tank".

Electricity plays a significant role in all crop drying operations. Even when liquid fuel is used as the heat source, electricity powers the fans and controls fuel flow. When LP gas becomes scarce and its cost escalates, farmers often turn to alternate heat sources such as electricity and solar. Many have already made the conversion.

Dairy, poultry and confinement-type hog and beef farms are big energy users. For example, about 550 kilowatt-hours of electricity, six gallons of LP gas and 10 gallons of gasoline are required for feeding and maintaining a high-producing dairy cow for one year.

THE IMPORTANCE OF TIMELY ENERGY USE ON FARMS

Time and timeliness are two factors of great importance to food producers, food processors and energy producers. The use of large diesel tractors, selected to compete with unpredictable weather patterns, cannot wait for fuel deliveries if farmers are to till, plant and harvest on a timely basis. Each day of delay beyond the optimum date reduces yield, increases potential loss and affects net return. Energy production, energy availability and energy supply-distribution programs have a direct impact upon food production, quantity and quality. Energy for timely harvest also affects the nutritional values of food.

The three percent (3 percent) of U.S. energy used by farmers may seem like a small part of the total use. It, in fact, is. But its availability in the right amount, the right kind, in the right place at the right time is critically important. Any national policy on energy priorities must consider the time and timeliness of all types of energy supplies so they are available to food producers and processors. Energy availability on a timely basis affects every food consumer.

The off-farm energy needs for producing fertilizers, herbicides and insecticides are of importance to both producers and consumers. Commercial fertilizer production requires about two percent (2 percent) of annual U.S. natural gas consumption. But that fertilizer accounts for ⅓ of our crop yields. Scientists report that, during some years, up to 40 percent of our food and fiber production could be lost if pesticides are not used. Others estimate that herbicides save from 100 to 170 million gallons of fuel a year by reducing machine time.

ENERGY USE AND FOOD EXPORTS

The United States is the world's leading food exporter. Nearly half of all grains traded internationally leave our American shore. In 1979, the U.S. exported about: 60 percent of its wheat; 56 percent of its soybeans; 50 percent of its rice; and 26 percent of its feed grains.

Energy use in agriculture benefits all Americans through food exports. The dollars received from food exports help offset the high cost of imported oil. Products grown from one out of every three acres are exported to help others. Thus, we can rightfully say that one-third of our farm energy is used outside our country to reduce hunger.

When looking at the benefits of energy use for food exports, we must be conscious of potential disadvantages. When economic incentives encourage families to grow crops (rather than livestock) on marginal land, what are the long-term food production impacts of increased soil erosion, or of increased quantities of energy-intensive fertilizers needed to replace soil nutrients lost, in part, due to crop farming on too-frequent a basis?

On-farm fuel production can, indeed, offset the nation's ability to maintain a reasonable quantity of exports. Balances must be maintained.

ON-FARM ENERGY COST IMPACTS

In farm production, fuel and energy expenses account for about six percent (6 percent) of total farm inputs, according to U.S.D.A. That, of course, is an average and that means little to the large dairyman, or the large irrigated crop farmer.

The farmer whose operation is predominantly dependent upon petroleum can hedge (to some degree) on energy availability by increasing his on-farm storage capacities. He, himself, can help avoid Man-made delays thus enhancing his opportunities for more timely planting, fertilizing, and harvesting which usually leads to greater economic return. Agricultural economists have estimated that a doubling of energy prices would result in a 13 percent increase in farm commodity prices.

Average energy prices and their impact upon average farm commodity prices also mean little to the farmer who is heavily dependent upon electricity on a regular and timely basis. He is more concerned about the escalating demand and use costs caused by conflicting unpredictable and excessive regulations, costly construction delay, high interest rates and uncertain forecasting.

To illustrate this point, I will use a central Missouri generation and transmission (G & T) cooperative construction program. The cost of pollution control equipment on their newest generating plant which began operating this year (1982) was 1.3 times the total cost of a similar size plant constructed at the same site twelve years ago. Pollution control costs (which would meet requirements in Detroit or in Louisville) constituted 25 percent of the total cost of this new plant. My distribution cooperative had to raise rates 23 percent when the plant came on line a few weeks ago. I'm not nearly concerned about my monthly bill as I am about the mid-Missouri farmers with dairies, confinement feeding systems or crop irrigation systems that use large amounts of electricity. If they cannot recover these energy cost increases, they may not survive. Farmers, of course, have few opportunities to set the price of the grain and food they produce.

ENERGY AVAILABILITY AND ITS IMPACT

An on-farm energy shortage can affect every consumer in the form of short food supplies and/or rising prices. It would affect our national status and economy because of the smaller quantities of grain that we could export.

Energy shortages and/or undependable service would have a much more drastic impact upon food supplies and food prices than would the cost of energy for food production, processing and distribution. Steps must be taken to avoid the collapse of any link in the food chain.

We all know there have been recent periods of seemingly excess amounts of petroleum and of food. The sluggish economies of this and of other nations have been major contributing factors. We would expect change. There is a fine line between oversupply and undersupply, or shortage. In the long-term, we must be ready to cope. We must get ready to act. We must, when necessary, do a better job of managing production, distribution and use. We can use our more abundant resources to greater advantage. We now have the opportunity to use our coal and nuclear resources to power more and more of our stationary operations. Electricity for substitutions is available, now. Our prime fuels, oil and gas can and should be used for our mobile equipment—at least, in the near term.

Some would say that we should not encourage more electric energy use until such problems as nuclear waste, acid rain or high voltage transmission line effects are resolved. However, I'm optimistic that future national regulations will be based upon the latest and most sound results. Recent reports from my alma mater, Iowa State University, indicates that sulfur emissions enhance corn production; and pigs raised under a 345,000 volt transmission line gained slightly more (not significantly more) than those in the control group.

All of these factors, and many more, can have a favorable effect upon the availability of energy supplies for the food system. The extent of that effect, of course, depends upon society and upon policymaker attitudes and actions.

ON-FARM ENERGY MANAGEMENT AND SUBSTITUTION

Many U.S. farmers have done, and are doing, an efficient job of managing their available energy resources. Some can do better. These points were borne out by the recent testing of a Farm Energy Analysis checklist program being developed by the National Food and Energy Council, Inc.

Farmers will use more (or less) energy to get a job done, as the economic situation dictates; and they will use other forms of energy if they are made aware of advantages and if they have economic benefits.

There are specific areas of agricultural production which need and are receiving more attention for effecting more energy-efficient practices. These include crop irrigation, crop drying, water heating, milk cooling, the warming of livestock buildings, minimum tillage and other modified field practices.

The adoption of better energy management and substitution practices are not new to livestock farmers. As an agricultural representative, I helped Illinois farmers convert their labor-intensive PTO feed-grinding operation to an automatic electric system. That was 32 years ago. Farmers then switched from petroleum to coal-generated electricity for grinding livestock and poultry feed. This helped level the power supplier's electric load by grinding only at night. Farmers saved labor, and they saved energy and dollars.

Some would call that marketing. I call it education-oriented, selective marketing to do a job in the most energy-efficient way. In many states today, power supplier representatives are forbidden to do such marketing, even when it can benefit the energy supplier, food producer and food consumer. Frankly, I do not understand some commission policies.

This example is used because it happened—over three decades ago. There are, today, many other opportunities for the prudent, economical substitution of coal generated electricity. If the correct atmosphere and climate can be established, all consumers can benefit. Meanwhile, all feasibly economic energy alternates and/or supplements must continue to be explored.

There are other important aspects of energy management, especially where electric energy supplies and capacities are concerned. In order to make the most efficient use of generation, transmission and distribution equipment, large electrical loads must, where possible, be controlled.

The electric industry has developed a national grid system that has helped alleviate some of the peak load problem with power transfer from area to area depending upon weather conditions. This concept involves use of high voltage transmission lines which also involves the need for public understanding.

Another popular farm energy management practice is that of minimum tillage for rowcrop farming. Less energy is required. Soil erosion is reduced. But the long-term evaluation on energy required for chemical applications (and their production) for effective weed and insect control is still underway.

ON-FARM ENERGY OPTIONS

In the mid-70's some U.S. Department of Energy experts predicted that solar energy would supply 20 percent of all U.S. energy needs by year 2000. Others said solar might provide 5 percent of the total. There is, of course, considerable ongoing research on wind energy. Such is often considered a part of the solar energy scenerio.

Of the two different levels of solar energy (solar thermal power and individual systems) only the latter will be addressed here. The longtime use of solar energy to produce our crops, year-after-year, is not included in the above percentages.

Many farmers have adopted passive and solar systems for crop drying, for heating swine and poultry buildings and for water heating. The early energy research thrust, instituted at many agricultural experiment stations, is reaping good dividends. This is a tribute to those who recognized the great body of knowledge and expertise that was "on stream" and available for the necessary and desirable interdisciplinary approach. At no other research sites could experts representing so many disciplines, be drawn together so quickly to do a job as well. Similar interdisciplinary groups are now working toward solving those problems associated with the use of farm-produced alcohol and vegetable oils and substitute fuels for mobile farm equipment. In the production and use of these fuels there are some relevant questions that must be addressed. Some are:

Should farm-produced fuels be used for off-farm purposes?

Should we use grain or cellulosic material for alcohol production?

Given the large number of diesel tractors, should vegetable oil research be favored over the alcohol approach?

Does on-farm fuel production encourage increased soil erosion?

What long-range impact does land-for-fuel have upon food-for-export?

Are there ethical questions to be addressed on the land-for-fuel vs. the land-for-food issue?

Should all stationary power units be electric-driven so as to put dependence upon our most abundant resource, coal, and to reduce oil imports?

There are, of course, other on-farm energy production systems and techniques that are being explored. While methane-from-livestock waste may not be economically feasible now, policymakers and researchers alike are to be commended for their work in generating design data which can be used when that "time-of-need" arrives.

AGRICULTURAL RESEARCH AND EDUCATION

The regular, long-standing investments of public funds in our agricultural research and educational system are some of the best that the U.S. has made. All citizens benefit, indirectly if not directly. Such funds, effectively used by some of the nation's leading scientists and engineers, through interdisciplinary activities provide the greatest opportunity to generate excellent dividends. Numerous success stories have not only generated manyfold returns on investments but have instilled in young men and women (at the universities) the excitement and challenge of food or energy-oriented research that can lead to more and more significant technological breakthroughs.

It is undoubtedly well-known that the formula funding, originating from the Hatch Act and McIntire-Stennis Act, forms the backbone of the Agricultural Experiment Station system. Its researchers and scientists perform over 65 percent of all the publicly-funded agricultural research in the U.S. Even if that funding had kept pace with inflation over the past decade, it would have been a great investment. It has not kept pace.

It is my understanding that the National Association of State Universities and Land Grant Colleges are requesting about a 7 to 7.5 percent increase in appropriations for FY 1983. That seems to be a reasonable request.

Recognizing the value of ongoing research that can impact greatly upon the availability of future food supplies (and the related energy technology, development, management and substitution factors that affect those supplies), I would urge all, who can, to support such a modest increase in order that the agricultural research system can replenish the agricultural technology shelves which have become much too bare in recent years. Food consumers will benefit from such an investment—even at the time when many have a concern for reduced national spending.

OFF-FARM ENERGY USE

The total food system uses 16.5 percent of all energy used in the U.S. Of all food system energy use, five different sectors of the food system use the following portions:

	Percent
On-farm production	18
Processing of grain/food	33
Transportation of food	3
Wholesale-Retail	16
Final Preparation	30
Total	100

Overall, the food system is about 70 percent dependent upon petroleum energy. The food processing sector, accounting for ⅓ of all food-related energy depends heavily upon natrual gas. But their rate of electricity use increase is now about double the increase in total energy use.

The final preparation of food (in homes and in commercial facilities) is heavily dependent upon electricity. This part of the food system accounts for 4.3 percent of U.S. energy use. That's about 1.5 times as much energy as used by all U.S. farmers. The way consumers want food packaged, the way food must be packaged due to regulations and the way manufacturers do package foods makes a difference in the amount of energy used per unit.

Just as farmers must be assured adequate amounts of energy to produce, other links of the food chain must have energy to move, to process, to distribute and to preserve the food until consumed. Otherwise, much of the energy required to produce that food would be lost. Automatically controlled electric energy plays many key roles in each sector of the food system.

TOWARD PUBLIC UNDERSTANDING—OF AGRICULTURE AND ENERGY

Communications will play a significant role if our nation is to develop a cohesive energy policy which will foster a team effort that can result in having adequate energy supplies for all links of the food chain.

Many in government, industry and education use the term conservation. To some that means "don't use energy". To others, it means "use energy as efficiently as possible". We don't always convey the same thought with the word, "conservation".

Some use the term conservation energy. I'm not sure what that means. If a farmer uses less fuel to perform some field task, he has more of the same kind left in the fuel barrel. But I doubt if he will readily understand how he might produce 109 bushels of corn/acre with "conservation energy", rather than with the stored diesel fuel that he must actually use.

Some in and outside of government use the term "energy self-sufficient" farms. This term is misleading. As an eastern Iowa farm boy, we had no electricity and no tractor. We raised hay, oats, corn and soybeans for our draft animals, dairy cows and hogs. We did not have an energy self-sufficient farm. We bought coal for the furnace and oil for the lamps and the lantern. Therefore, if today's farm operation is to contribute to our national food needs, it will not be "energy self-sufficient". Even the "energy-integrated" farms which have much promise are likely purchasing a considerable amount of energy off-farm.

There are many different aspects to the development of an atmosphere and a climate that will assure future energy supplies, in whatever form, for use in and throughout the food system, on a timely basis.

ENERGY FOR THE FOOD SYSTEM—RECOMMENDATIONS

Energy management principles must be practiced in all links of the food chain. Energy conservation (using energy efficiently) is one important part of energy management. The time and timeliness of energy use is another component. It is extremely important in the use of large electric power units.

Wherever feasible, the more plentiful and/or renewable fuels should be substituted for those fuels in shortest supply. This is especially applicable to mobile power units.

The nation's more abundant fuels should be used, directly or indirectly, for powering our stationary machines. Electricity's ease-of-control feature should be utilized to encourage the use of small components over longtime periods, as opposed to large units operating for short periods. Lower investments for food suppliers and the energy suppliers can result.

The research and development of all energy resources should be expedited especially in those areas where promising results are visible and relate to the nation's food production, processing and distribution capabilities.

Where institutional concerns inhibit energy efficiency optimization, such should be forthrightly addressed by the parties involved.

Because of the many interacting factors of food and energy production processing and distribution, a greater emphasis should be placed upon utilizing the talents of scientists and engineers in the nation's network of agricultural experiment stations, with associated and adequate public funding. Interdisciplinary research/educational teams can be quickly marshalled to evaluate the future productivity of land used to produce fuel much as their talents have been used to research and demonstrate solar and alternate fuel system applications.

Where no substitute fuels are available for mobile operations (and when the job cannot be converted to a centrally-located, stationary operation) priority energy availability/use assignments must be made. A system that can assure appropriate, adequate energy supplies when and where needed in each sector of the food system during emergencies is imperative. If food cannot be handled and preserved, once produced, it can be of little value. In addition, the energy required to produce such food is virtually lost.

In developing or extending a communication system that recognizes the interdependence of food and energy, care must be taken with the use of terms like conservation, conservation energy and energy self-sufficient farms. They mean different things to different people.

Any national energy policy must create an atmosphere and climate which allows, and even encourages, the nation's energy suppliers to make the right choices and take correct actions to meet future energy requirements on a timely basis and at prices that will regenerate and/or maintain a strong and viable national economy.

It is, perhaps, relevant to note that some of these recommendations are not unlike those made in 1977 by a group of 40 engineers and scientists who prepared a report called Energy Policy For The Food System. I was a participant in that group effort which was co-sponsored by the American Society of Agricultural Engineers (ASAE) and the Engineering Foundation.

In 1978, I was also a participant in the development of A National Policy On Standards For The United States. I represented ASAE and agriculture. With private sector leadership and some governmental input, that policy is now encouraging better national and international trade relationships. That policy benefits all, directly or indirectly.

I would hope that this nation can develop reasonable energy-for-the-food-system policies that are simple, efficient and cost effective. Some national policy decisions must be made. The *time* and *timing* of those decisions may be as important as the decisions themselves.

Thank you!

STATEMENT OF HON. DAVE DURENBERGER, A U.S. SENATOR FROM MINNESOTA

Mr. Chairman, you and I represent neighboring States, agricultural States. But more than that, I know that we represent a shared concern for the energy security of our whole nation. We have worked together on many energy issues in this Congress. Emergency oil allocation. Financing for the Rural Electrification Administration. Incentives for conservation and renewable fuels. I sometimes wish that we didn't have to work so hard to assure that this country has an energy policy, but I have always appreciated our partnership and look forward to opportunities like this hearing to continue our efforts together.

Not long ago, several hundred Minnesota farmers gathered at the State Capitol in St. Paul to protest conditions that were forcing many of them out of business. A news reporter went up to one man at the rally and asked where his farm was located. The man said he wasn't a farmer, he was a teacher from the Twin Cities. So the reporter asked him what he was doing at this farmers' rally. And he answered, "I like to eat. Food doesn't grow in supermarkets, you know."

What he was saying was simply that we all have a stake in the success of our farmers. American farmers feed this country. They feed the world. Their security is our security.

I do not have to tell any member of this Subcommittee that these are critical times for the country's agricultural sector. I have seen it firsthand, heard it from farmers in my State, men and women who are trying against large odds to save the heritage of their family farms.

On top of all the economic problems, farmers take another risk—a risk that no longer makes the headlines, but one they surely face as they go into the fields to plant this spring. And that risk is that when it comes time to harvest this fall, energy supplies might not be sufficient to get the crop out of the field and the government of this nation will not be prepared to do anything about it.

Mr. Chairman, we are seeking the systematic dismantlement of this country's energy policy. This Administration appears determined to undo the energy policy that it took Congress and the nation nearly a decade to design.

The President has recently sent us legislation to abolish the Department of Energy, to end the tax incentives for conservation and renewable fuels, to halt the loan guarantees for alcohol fuel plants, to terminate the low income home weatherization program, and to reduce the loan authority for the REA. And just a month or so ago, the President vetoed a carefully drafted and critically needed bill to replace the Emergency Petroleum Allocation Act.

Mr. Chairman, I know you will agree with me when I say that S. 1503 was carefully drafted to meet the nation's needs during a petroleum disruption, because you and I started the effort to replace the EPAA by introducing a petroleum policy bill about this time last year. And our efforts were reflected in the bill that passed the Congress.

But the President vetoed that bill and did so with an argument that he consistently offers as he goes about dismantling the energy programs of the Federal government. This Administration believes that the nation should rely on markets—solely on markets—for the decision that will determine our energy future. Well, Mr. Chairman, as a Republican, I must agree that the marketplace is to be preferred to the government as a device to allocate goods and services in our economy. But being

Republicans does not require that we be blind to the actual conditions in the markets that our constituents face in daily life. Many of them don't work in ways described by the economics textbook.

My disagreement with this Administration on energy policy—and it is a deep disagreement—is based on my belief that we don't have an energy marketplace in this country, today. Let me break the issues down into four parts—petroleum, natural gas, electricity and renewable fuels—to make my point.

First, petroleum. We remain in the grip of the OPEC cartel and subject to the political events of the Middle East. We have had a glut recently, but we have also been in a deep recession and the Saudis for a long period produced at levels well beyond their revenue needs in order to stabilize prices. Those days are over and we are headed toward tighter supplies.

The best thing that this nation can do to be prepared for another shortfall is to build up our inventories of oil, both those owned by the government and those held by the private sector. In the event of a disruption, we can use those inventories to meet our petroleum requirements. So while we have the glut and prices are falling we should be building stocks. But what is actually happening out there in the marketplace?

The marketplace is moving in just the opposite direction. For the first 133 days of this year, petroleum and crude oil stocks held by refiners dropped at a rate exceeding 1 million barrels per day. We have 100 million barrels less in inventories than we did at the beginning of this year.

In fact, the inventory situation has reached such a low point that spot shortages are showing up in the rural areas of the Midwest. The Minneapolis Tribune reported just this morning that the agricultural industry in my State is having trouble with supplies and prices. Prices are rising by a nickel and more per week as a result of the low inventories, inventories that are lower than those experienced even in 1973 and 1979.

Why is it that the marketplace is working everyday to make us less prepared for any future disruption? Viewed from the public interest this is truly a shocking development. But viewed from the perspective of what is called the energy marketplace it is perfectly understandable. In that marketplace, one builds stocks when prices are high or rising—inventory profits can be made. In fact, in 1979 when prices were at an all-time high and Americans were sitting in gaslines, petroleum inventories increased at an average rate of 100,000 barrels per day. And inventories kept on building through 1980 and 1981. But at the beginning of this year when prices started to fall, so did inventories. And they have fallen to the point that spot shortages are occurring in rural areas.

The tendency to hoard during a shortfall makes even small disruptions difficult events for our economy. The tendency of the marketplace moves in a direction just opposite to what the nation needs during those periods. That is why we need a petroleum policy that authorizes our government to allocate oil supplies during an emergency. That is why we need a government owned Strategic Petroleum Reserve to be used as a supplement to private markets.

Mr. Chairman, let me switch quickly to electricity to illustrate another failure to understand the marketplace that has led to energy proposals that I cannot support. In 1981 and again 1982, the Administration proposed reductions in the loan authority available to the Rural Electrification Administration. It was argued that our rural co-ops should go into the private marketplace to seek financing. That there was no longer any justification for a loan subsidy to rural electric co-ops.

The only problem with that proposal is that the private financial markets would not have provided any capital even to the biggest of the co-ops. It was a proposal to shut the door on REA. What the Administration didn't realize is that the entire capital structure of a cooperative electric is debt financed. There is no equity to stand behind the loans. No banker I know is going to make a private sector loan to an organization that is 100 percent debt financed.

One can argue I suppose that co-ops should be just like our investor owned utilities and financed in the same way. But if that were possible we would never have needed an REA, because the IOUs would be providing power to all parts of the nation, even the most rural areas. That the investor owned utilities did not find sufficient profit potential in rural areas to justify doing business there is not surprising. Distances between customers are long and the capital investment per unit of sales is very high. The marketplace failed to provide electricity to our farms and small towns. Government has a role to play when such failures occur. REA is the best success story I know in the Federal government. And this Administration wanted to throw it away in the name of an abstract commitment to the marketplace. That is the kind of policy that I can't support.

Mr. Chairman, I am not going to have time to cover natural gas and renewables this afternoon. But let me ask that you include in the record some material that I have brought with me today, where I try to make similar points about bowing to the theory of the marketplace when the reality of those markets moves in the opposite direction.

And let me if I can, Mr. Chairman, conclude on this note. My testimony, I hope, didn't sound like special pleading for the agricultural sector of our economy. What is good for agriculture is most often what is good for the nation as a whole. I certainly believe that is the case in energy. But agricultural interests are always out front on the energy issues, because the problems in our energy markets always seem to hit agriculture first and hardest. When it is time to plant or harvest, the farmer cannot wait for supplies to reach his field. The good of the entire nation depends on his access to the energy necessary to get his job done. If we fail to understand this point and fail to understand the reality of the marketplace in which our farmers operate, this nation will forever be unprepared to meet the energy challenges that lie ahead.

Floor Statement by Senator Dave Durenberger on S. 1503. The Stand-by Petroleum Allocation Act of 1982, March 24, 1982

Mr. President, I am speaking today to urge my colleagues in the Senate to override the veto of a Republican President. Speaking to such a purpose is a rare experience for a Senator. Opposing a President of my party on a veto message is not an experience that I have had before. Nor is it one that I expect to have again.

I say to my colleagues that I come to the floor for this debate respectful of the President and respectful of his views. However, I also come with some knowledge of this legislation and the events which have brought it before us. When the 97th Congress convened in January 1981, it was clear to me that the expiration of the Emergency Petroleum Allocation Act would be one of the most important challenges that this Congress would face. EPAA was for nearly a decade the centerpiece of our nation's energy policy.

I also want to say that we have met the challenge more forthrightly than I had expected. It seemed to me in January of 1981 that replacing EPAA with a policy that corrected past mistakes while anticipating future dangers was an unlikely prospect. There was no energy crisis to compel our action. OPEC held no gun to our heads. And yet we are here with an opportunity to pass a good bill—an excellent bill—that can provide our nation with a more secure energy future.

That we have met the challenge successfully is due primarily to the leadership and effort of the Chairman of the Energy and Natural Resources Committee, Senator McClure. In July of last year, I joined with 15 other Senators to introduce a bill in many respects similar to the one we consider today. I testified at the Energy Committee hearings on S. 1503. I came to the floor for the debates last fall. I watched closely as the Senate conferees worked out differences with the House. I know well the efforts that the Senator from Idaho has put into this legislation and express with my colleagues personal appreciation for the legislative skill that he has demonstrated by steering S. 1503 through the process.

The only thing we have not been able to accomplish is to convince the President that this legislation is needed. Although short, the President's veto message is very thorough. It raises all of the arguments against this bill that have been heard many times at hearings and in floor debate. There are four basic arguments against S. 1503 in the veto message. These arguments have been repeated many times. These arguments have been repeated so many times with so little evidence that they have almost become myths. I will call them myths as I review each one of the four.

The first myth is that the Department of Energy caused the petroleum disruptions in 1973 and 1979. Somehow we are asked to believe that if the government hadn't gotten in the way, Americans would have experienced little inconvenience as a result of the Arab Embargo and the Iranian Revolution.

Let me quote from the President's veto message:

"Those interruptions precipitated much higher oil prices, but they did not cause gas lines and shortages. It took government to do that."

I would be the first to agree that DOE did not do a good job in 1979. Many mistakes were made. But when we look at the most serious errors, it might be fair to conclude that DOE failed because it was not well enough prepared. I believe the most damaging decision was the emergency regulation to change the base period for allocations. That regulation was published on February 28 and made effective on March 1. As a result, many marketers lost entitlements from suppliers. Shall we invite the same damage again by waiting once again until we are in a shortage to let the market know what government intends?

I also remember another aspect of the 1979 crisis. One of the most serious aspects of that emergency in the Midwest was its impact on the trucking industry. Independent truckers across the country went on strike. In Minnesota they used their trucks to blockade refineries. The governor had to call out the National Guard in my State.

Truckers couldn't get enough fuel to carry food to consumers. And what they could get was priced beyond the rates they could charge. So they went on strike. Were they demanding that government get off their back? Shall we blame the truckers' problem on DOE and the allocation regulations?

Truckers use diesel fuel. DOE did not allocate diesel fuel in 1979. Diesel fuel along with other middle distillates like heating oil was decontrolled in 1976, before there ever was a DOE. Don't try to tell a trucker or a farmer that government caused the shortage in 1979. Their complaint was that we did nothing until it was too late. And their complaint was impassioned because the market did not bring fuel where it was needed.

The second myth contained in the President's veto message is that we already have sufficient plans and authority for the President to act in a crisis. Let me quote again from the President's message:

"Today I have ample authority to take the steps necessary to protect national security, meet our treaty obligations, and assure public health and safety functions."

The President does have emergency authorities under several acts to respond in a crisis. But what we don't have is a national consensus on what the President should do or a specific plan saying what he will do in the case of an extreme disruption. Authority is more than a delegated right to take action. Authority is based on the understanding and belief of the American public—belief that the plan to deal with the emergency is fair and effective. That is the kind of authority that we have never had in an energy crisis because Presidents have not come well prepared to these events.

We have made substantial progress in filling the Strategic Petroleum reserve over the last year. The Administration rightfully takes pride for its accomplishment in rapidly filling the Strategic Petroleum Reserve. The Reserve contributes greatly to the nation's energy security.

But I challenge any Senator to tell me what we plan to do with that oil. We have 250 million barrels in storage, $8 billion worth of crude. We have a goal of 750 million barrels. A reserve of that size could carry the nation through a shortage of 4 million barrels per day for a six month period.

But would we use that oil in such an emergency. No one knows. There is no specific plan to distribute oil from Reserve. We spent $3 billion on an insurance policy last year without knowing what kinds of events we were insuring against. I am one of those Senators who thinks we should use the Reserve first before we turn to allocations of private stocks. We should not save it to be a weapon in wars only. Other Senators take a different view. But no senator knows for sure when we would use that oil. And my desire to spend for this insurance policy wears thin. That is why we need the standby plans mandated by S. 1503.

Those are the kinds of signals that the marketplace needs from S. 1503. The value of private stocks depends critically on what we intend to do with public. And we don't know what this President intends to do with SPR. Ample authority? If there is ample authority in other laws—and the Justice Department found otherwise—that authority is not being translated into the public understanding necessary to get us through the next energy emergency.

The third myth contained in the President's message is that standby regulations discourage private preparedness. Let me read again from the President's message:

"The threat of such controls will discourage the very steps that are needed to provide real protection against such emergencies. This bill would discourage self-protective measures, because it tells the public that those measures will be nullified by government allocations and controls or that such measures are unnecessary because the government will guarantee them low-priced energy in the event of any disruption."

Well, if that's what this bill did I would oppose it. In fact, it is the failure of the government to make clear what it intends that will discourage private stockpiling. This bill says that inventories on hand at the time of a disruption shall not be allocated. The President can use the authority granted by this legislation to make it clear to refiners that we will not bail them out if they do nothing now to help us prepare. I should think the President could use this authority to leverage substantial private stocks even in a falling market. Prices are falling. Stocks will disappear. It's the law of the marketplace.

Let this bill die here—let the planning process stop now—and the oil companies will retain lobbyists rather than crude oil. Because they know, faced with a shortfall, unarmed with a policy, Congress will rush in to spread the pain without careful concern for equity or existing inventories. We can close that door now with this bill and a plan that sends clear signals to the marketplace. The signal is, be prepared.

Myth number four is that the energy crisis is over. Again, I will quote the President's veto message:

"The current world oil situation, with declining prices and ample supplies, provides the best opportunity for future preparedness."

Not true. No one holds inventories, increases stocks, while prices are falling. I refer, Senators, to our experience in 1977 and 1978. The oil companies were expecting a price increase at the OPEC meeting in early 1978. So in late 1977 they increased stocks to very high levels. No price increase came in December, none in March, none in June. So stocks were reduced. Private stocks fell to very low levels and then we had the Iranian Revolution and the petroleum marketplace came unglued. The marketplace was unprepared. We had no reason to expect the marketplace to be prepared. It behaved like a marketplace. You sell when prices are stable or falling.

You hold when prices are increasing. That's how small disruptions become major emergencies. That's what causes gas lines.

The energy crisis isn't over. The gas lines of the seventies aren't behind us. It's true that we have a glut. It's true that prices are falling. It's true that Americans are using less oil. But it isn't true that expiration of EPAA brought on all these blessings.

OPEC is still in charge. We have a glut because Saudi Arabia decided to produce at 10½ million barrels per day for over a year. Saudi Arabia has a lot of oil. They can—they want—to sell oil at present volumes well into the next century. In that respect they are different than other OPEC members whose wells will go dry in a decade or two. Saudi Arabia thought we might have a little too much petroleum conservation at $40 per barrel. So they over-produced and brought prices down to $33. When prices continued to fall they cut production. Markets will be tight again by this time next year. Particularly if we get a Republican recovery. What Senators sometimes forget is that today's conservation is in large part recession induced. Demand does tend to fall when the economy slows down. Speed-up the economy and we will be right back in the seventies with gas lines waiting for a political event in a foreign nation. I hope we won't be waiting for the Congress and the President to design a fair and effective energy policy.

Four myths, Mr. President. Four myths that we hear over and over again by those who would leave our energy future to a marketplace controlled by a foreign cartel.

There is one other aspect of the President's veto message that I want to mention today. That is the request in the last paragraph that we reauthorize the International Energy Agency program. In light of the President's arguments against S. 1503 that is a surprising request. The IEA program is an allocation program. It allocates crude oil between nations in the event of a shortfall. It authorizes the President to allocate oil here in the United States so that our importers can divert their supplies to other nations.

In Minnesota we are at the end of the world's oil pipeline. We are an agricultural state. When it is time to plant or harvest our crops, even small shortfalls are a disaster. We cannot afford the tendency of the marketplace to hoard when prices are rising due to a disruption. That is what happened in the Spring of 1979.

We rely primarily on two independent refineries in Minnesota. I freely admit the conditions of the petroleum marketplace in Minnesota. Some people will see these conditions as an explanation for my strong interest in this legislation. What I have to explain to my constituents in Minnesota is why the President wants authority to allocate crude oil for disruptions that threaten Italy or Japan or Germany, but vetoes a bill that authorizes allocations when Minnesota's energy supplies are disrupted. Perhaps my colleagues can enlighten me on the reasons for this two-headed energy policy.

Mr. President, the arguments for this legislation have been thoroughly stated by the Senator from Idaho this afternoon.

We are not reauthorizing EPAA.

We do not mandate any policy or intervention by the Government. The authority is discretionary.

The bill contains an effective sunset that assures primary reliance on the marketplace.

The bill pre-empts allocation programs designed by the States and thus actually reduces the amount of intervention that would accompany a shortfall.

Mr. President, a year ago the Senator from Idaho began a process to determine whether we could make good energy policy by legislation in a period of relative calm. We have before us a good bill--and a Presidential veto. We have but one more step to take to meet a most difficult legislative challenge. I urge my colleagues to take that step by reaffirming votes cast for this legislation on previous roll calls. Let us give the nation a more secure energy future by affirming our efforts of the past year.

Thank you, Mr. President.

U.S. SENATE,
COMMITTEE ON FINANCE,
Washington, D.C., May 8, 1981.

Hon. RONALD REAGAN,
White House, Washington, D.C.

DEAR MR. PRESIDENT: By this letter I want to express my sincere concerns regarding your proposals to reduce government support for financing rural electrification and telephone programs. I want you to know that I generally applaud your efforts to change the role of the Federal government in American society. Your vision of a different relationship between government and the economy is our best hope to put America back to work as the leader of the free world.

However, in fulfilling your promise to attack the abuses and excesses of government, you must not forget that there is and always will be a role for government in regulating and assisting a free enterprise economy. The marketplace by itself does not always produce a socially efficient allocation of benefits and costs. In the 1930s it became clear that the private sector alone could not rise the capital necessary to deliver electricity to the rural parts of our nation. So the Congress created the REA in 1936. This government program was and is one of the real success stories in our history. Today 99 percent of rural America is served by the REA-financed electric cooperative system. Electrification was part of the revolution in rural America that makes the Midwest the bread basket of the world.

In the 1940s it became clear that the telephone industry, unassisted by government, would not provide adequate telephone service to all Americans. The low densities in rural areas made the extension of service very expensive and the profit calculus of the marketplace did not support rural investments. In 1949, the Congress amended the REA act to provide capital for a rural telephone system. Millions of Americans who might not otherwise have been able afford this necessity of modern life are now served by REA-financed telephone systems.

The history of the telephone and electrification program of REA cannot be read as government excess. Without the power and telephones lines reaching virtually every American the economic and social cleavage between urban and rural America would the economic and social cleavage between urban and rural America would be deep and difficult to bridge. And we would be without the strength that our farms and small towns provide.

The principal instrument of support offered by the government during the first four decades of the REA was the 2 percent direct loan with the money drawn from a Congressional appropriation. This money was used by cooperatives organized at the county level to build distribution systems. The power distributed quite often was drawn from government owned public power projects including the dams on America's rivers built by the Corps of Engineers.

In the 1960s the distribution system was largely in place and some suggested that the need for government financing no longer existed. But in this period the REA program was going through a second revolution. Electric power was being applied to the whole range of agricultural tasks to raise the level of productivity. Every part of the electric utility industry was predicting sustained growth that would cause a doubling of capacity needs every 10 years.

Because no part of the investor or publicly owned electric industry would guarantee the firm power requirements of rural America, the county distribution cooperatives felt it imperative that they form their own generation and transmission systems. I had personal experience in this second revolution as I served for seven years as counsel to four distribution co-ops, a "G & T," and the Minnesota Rural Electric Cooperative Association. The Minnesota distribution co-ops formed two associations, Cooperative Power of Edina and United Power at Elk River, to assure the electric power needs of their customers by the only means available.

In December of 1972, President Nixon proposed that the REA program be terminated. Although the President's proposal was not adopted, it did lead to a significant restructuring of the REA program by the Congress. The 2 percent direct loan program was modified so that the REA now generally issues 5 percent insured loans. Funds for these loans are no longer provided by Congressional appropriations but are drawn from a revolving fund of repaid principal and interest on previous loans. To finance the extraordinary capital needs of the generation and transmission systems, the Congress provided access to the Federal Financing Bank with a guarantee from the REA.

Mr. President, this brief sketch of the history of the cooperative electric and telephone systems provides the insight necessary to understand these organizations and the effects of the proposals you are now making. The electric and telephone cooperatives were not designed to function in private financial markets. Their financial balance sheets do not reflect the characteristics of strong investor owned utilities because of the history of REA. They do not have equity capital or high interest coverage ratios. Their physical plant was not designed for profit, but rather to provide service to every point in rural America. The criteria used by private lenders and investors if applied today to the cooperatives built by REA financing would have the practical effect of putting the generation and transmission cooperatives out of business. Your proposal to end insured loans for rural telephone systems will have the practical effect of abolishing or reducing service levels in many parts of our nation.

I feel that I have a personal stake in the success of your administration. I want your economic recovery program to succeed. I want you to to the best President we ever had because I want to support your programs and defend your record in the 1982 election. To successfully change the role of government, I think it vital that we understand the basic purpose of government. In the case of your REA recommendation the zeal to cut has apparently clouded the need to understand.

I would respectfully request that you reconsider and would offer my assistance in constructing a proposal reflecting an appreciation of the history of the REA and a vision for its future. You have received two letters from Senators making various proposals. One sponsored by Senators Andrews and Johnston flatly opposed your policies. The other sponsored by Senator Dole suggested that FFB financing be cut by 50 percent beginning in October. To my reading the 48 Senators who have signed these letters have failed to address the REA question in the context of your philosophy and the history of REA. My personal experience as counsel to local cooperatives and my deep commitment to the success of your presidency suggested that I not sign a political letter, but rather that I should make a personal statement and extend an offer to assist in the formulation of a different policy based on a broader perspective.

It seems to me that 5 percent insured loans for telephone and electric distribution systems from the revolving fund will continue to be necessary to insure adequate levels of service for rural America. I believe that if we take a longer view, we can restructure the generation and transmission cooperatives so that they could realistically be expected to rely on private financing. But this transition must be gradual, and I most assuredly would oppose any effort to terminate FFB financing on October 1, 1981, or deny the full value of the revolving fund to the local cooperatives.

It is my hope that these issues are receiving your personal attention and that the strength of your leadership can be used to reconsider and redirect your proposals on the REA.

Sincerely,

DAVE DURENBERGER, *U.S. Senator.*

U.S. SENATE,
COMMITTEE ON FINANCE,
Washington, D.C., February 9, 1982.

THE PRESIDENT,
The White House, Washington, D.C.

DEAR MR. PRESIDENT: Last fall, in your September 24th budget address, you proposed to repeal certain business energy tax credits as a means of enhancing revenues. In response, 62 Senators (including a majority of this Committee) and 266 Congressmen signed a resolution of disapproval which was ultimately incorporated into the fiscal year 1982 Continuing Resolution.

We are extremely disappointed that your budget proposal again seeks to eliminate the business energy tax credits. The repeal of these credits and exemptions for the various alternative energy technologies would be, in our estimation, an extremely shortsighted action exacerbating the nation's continuing dependence on expensive, unstable supplies of foreign oil. Clearly, the decontrol of oil, while a positive step, is not itself sufficient to encourage alternative energy investment necessary to reduce our dependence in a timely fashion.

Mr. President, thousands of individuals and businesses have responded to the tax incentives and to your own Administration's assurances as to their retention. They have taken considerable risks and spent hundreds of millions of dollars in an attempt to commercialize alternative energy technologies. Their investment in alternative energy production will contribute to the Nation's anti-inflation, employment, reindustrialization, and energy security goals.

As members of the Committee of Jursidiction, we are writing to inform you of our emphatic opposition to your proposal, and our determination to preserve a stable investment climate for a domestic alternative energy industry. We look forward to working with you to achieve our common objectives.

Respectfully,

Malcolm Wallop, Dave Durenberger, John Chafee, Spark Matsunaga, Steve Symms, John Heinz, Bob Packwood, Max Baucus, David Boren, Daniel P. Moynihan.

STATEMENT OF HON. J. JAMES EXON, A U.S. SENATOR FROM NEBRASKA

Mr. Chairman, and members of this committee, I am pleased to have this opportunity to make a few brief remarks regarding my concerns about the energy needs of rural America. Our nation is currently floundering without an energy policy. We have been lulled into complacency by the temporary oil glut which, according to reports, is drying up as inventories are rapidly depleted by oil companies.

More than any other segment of our economy, agriculture is held at the mercy of the energy industry. America's farmers are "price takers" with little or no ability to pass-on increased production costs. Energy has a significant impact on the production costs which only eat away at farm income and further reduces the thin margin of farm profits.

I have two major concerns regarding the Administration's attitude toward energy and agriculture.

First of all, I am concerned about the President's veto earlier this year of the Standby Petroleum Allocation Act. This action has left rural areas high and dry in the event of a severe cutoff of our oil supplies.

Agricultural and rural areas of our nation depend upon farmer cooperative owned and operated refineries for up to 45 percent of their fuel needs. These independent refineries rely primarily on the open market for crude supply, purchasing oil from either the major companies or the high-priced spot market. As the major companies withdraw from the rural areas to concentrate on the more highly profitable urban accounts on the East and West coasts, these small, independent farmer co-op refiners become even more important to the vital fuel lifeline for rural communities.

Absent a standby mechanism to ensure some allocation of crude oil during a severe shortage, these refiners are left to the mercy of the major oil companies. In a shortage situation, it is highly doubtful that the so-called "free market," would provide an element of fairness in allocating scarce crude supplies. A "referee role" is needed between the Big Oil haves and the small, independent have-nots to ensure that rural America maintains some supply at crucial periods like planting or harvesting time.

Recently, reports have surfaced in the Oil Daily that product shortages have occurred in certain parts of the nation. This is unbelievable in light of the reported supply glut. If the so-called "market" cannot operate effectively in a supply glut environment, I shudder to think what will happen to rural America during a severe supply shortage.

I would hope that the Reagan Administration would reconsider its position on standby oil disruption management legislation.

A second matter of concern to this Senator is the Reagan Administration's position regarding natural gas price decontrol.

I was pleased when the President announced that he would not seek accelerated decontrol legislation this year. However, almost immediately following this retreat, the President's own appointed Commissioner of FERC announced plans to accelerate price decontrol through administrative rulemaking. This persistence at "backdoor decontrol" is disturbing because, not only is it questionable that FERC has authority to proceed in this matter, but it also represents a total disregard for the impact upon agriculture.

A recent study completed by the Congressional Research Service, at my request, indicated that if natural gas prices were immediately decontrolled, including "old gas," America's farmers would bear an additional $2.5 billion in production costs for wheat and corn. The farm economy cannot bear such a heavy load with farm incomes already at near depression level figures.

Natural gas accounts for about one-third of the cost of nitrogen fertilizer production. Cost increases to fertilizer manufacturers would be directly passed through to farmers. In addition, natural gas costs would affect crop drying activities and irrigation units which operate by natural gas. Some seven Midwestern states which account for nearly 94 percent of natural gas consumption for irrigation, would be more heavily impacted. These states are Texas, Kansas, Arizona, New Mexico, Nebraska, Oklahoma, and Colorado.

To conclude, I believe that the Administration must take a closer look at the energy needs of agriculture.

Farm incomes are already at record lows and any support for the agricultural sector from the Administration appears long in coming. Disregard for the energy needs of rural America is a further slap in the face to the important food producing sector of the economy.

I thank the committee for its attention to this matter. I would submit for the record a copy of the CRS study on the impact of natural gas decontrol on farm production costs.

Thank you again.

EFFECTS OF NATURAL GAS DECONTROL ON FARMING COSTS AND INCOME

(Prepared at the Request of Senator J. James Exon)

(Prepared by Gary J. Pagliano, Specialist in Energy Policy, Environment and Natural Resources Policy Division; Jasper Womach, Specialist in Agricultural Policy, Environment and Natural Resources Policy Division; and David J. Cantor, Analyst in Energy Economics, Economics Division)

Increases in natural gas prices due to accelerated or full decontrol of natural gas wellhead pricing are likely to have a noticeable effect upon the costs of production in farming. The likelihood that these additional costs can be recovered by the farmer in the market for farm products, however, is small. On the one hand, increases in wellhead prices of natural gas are likely to be passed through both by gas pipelines supplying this fuel to farmers and by producers of nitrogenous fertilizers, which attempt to set prices on the basis of costs. On the other hand, as a seller of farm products, the farmer receives a price determined by the vagaries of present and expected shifts in demand and supply in an open market. This price is unlikely to reflect changes in gas prices in the short run. Thus, it is quite possible that farmers will be caught in a profit squeeze owing to higher costs of production incurred by rising natural gas prices. This report presents an analysis of the effects of alternative natural gas pricing schemes on costs of production in wheat and corn farming, based on scenarios involving decontrol commencing in 1982 developed by the U.S. Department of Energy.

Production costs could rise from 1980 to 1983 by about 11 cents per bushel of corn and about 7 cents per bushel of wheat under an accelerated decontrol pricing mechanism, and by about 12 cents per bushel of corn and 7 cents per bushel of wheat under immediate or full decontrol of natural gas wellhead prices. Under the present pricing provisions of the Natural Gas Policy Act (NGPA), costs of raising corn would rise by about 3 cents per bushel from 1980 to 1983, and costs of raising wheat by 2.3 cents per bushel. The decontrol scenarios involve an increase of between 55 and 60 percent in the natural gas component of farming costs over what the farmer would incur under NGPA in 1983. If, as we suspect, farmers could not pass these costs through to buyers of farm products, these costs would absorb an additional 3 percent of farm cash receipts in 1983 under accelerated decontrol, and 7 percent of farm cash receipts in 1983 under immediate decontrol.

I. EFFECTS OF NATURAL GAS PRICE DECONTROL ON COSTS OF PRODUCTION IN CORN AND WHEAT FARMING

A. Effects on Costs.—Under NGPA, the cost of natural gas embodied in a bushel of corn could rise from 11.6 cents in 1980 to nearly 14.7 cents in 1983; under accelerated decontrol, it could rise to 22.8 cents in 1983, and under full and immediate decontrol, to 23.5 cents. The cost of natural gas embodied in a bushel of wheat could rise from 10.2 cents in 1980 to 12.5 cents in 1983 under NGPA and to 19.1 cents in 1983 under accelerated decontrol and 19.2 cents in 1983 under accelerated decontrol.

These estimates are presented in Table 1. They have been obtained using U.S. Department of Energy (DOE) natural gas pricing scenarios and resulting DOE projections of natural gas prices. These prices were applied to technical gas input data furnished by The Fertilizer Institute, the American Gas Association, and the Council for Agricultural Science and Technology. Acreage and yield projections developed by Data Resources Incorporated (DRI) were employed to project effects into the future. A fuller discussion of the methodology is contained in the Appendix to this report.

Under all three natural gas pricing scenarios, the natural gas component of corn and wheat farming costs will increase, but at different rates and trajectories. Under NGPA, these costs of corn production increase at an annual rate of 8.2 percent from 1980 through 1983, or by 1.03 cents per bushel per year. Under accelerated decontrol, the annual rate of increase in calculated to be 25.3 percent; however, this increase is the result of a 63-percent surge in natural gas costs in 1982, and a 9-percent increase in 1983. Under full or immediate decontrol, the annual rate of increase in natural gas costs rises to 26.5 percent; as in the case of accelerated decontrol, this increase results from a surge in 1982 of some 82 percent. In 1983, natural gas costs embodied in a bushel of corn increase by less than one cent, or 1 percent, under immediate decontrol.

The natural gas component of the costs of wheat production follows paths similar to those of corn under the natural gas pricing scenarios. Under NGPA, the natural gas component of wheat production costs rises at an annual rate of 7.0 percent, or by 0.6 cents per bushel per year on average from 1980 through 1983. Accelerated decontrol would permit these costs to rise at an annual average rate of 23.3 percent, including a surge of 59 percent in 1982, and a subsequent change in these costs of 8.5 percent in 1983. Under immediate decontrol, natural gas costs would increase at an annual rate of 23.5 percent with a 69.4-percent surge in 1982 and a 2-percent increase in 1983.

The differences in the trajectories of costs under accelerated and immediate decontrol are due to the fact that accelerated decontrol constrains the adjustment to "free market" pricing in 1982 and leaves part of the release from control to 1983. Immediate and full decontrol removes all controls at once, allowing the price to adjust fully upon their removal.

TABLE 1: EFFECTS OF NATURAL GAS PRICE DECONTROL ON FARM PRODUCTION COSTS OF CORN AND WHEAT
(Cents per bushel)

YEAR	DIRECT ON-FARM COSTS COST OF NATURAL GAS a/		NATURAL GAS COMPONENT OF FERTILIZER COSTS		TOTAL NATURAL GAS COMPONENT OF FARM PRODUCTION COSTS	
	CORN	WHEAT	CORN	WHEAT	CORN	WHEAT
A. Continuation of Present Policy - NGPA b/						
1980	3.5	c/	8.1	10.2	11.6	10.2
1981	4.0	c/	8.9	11.1	12.9	11.1
1982	4.4	c/	9.5	11.8	13.9	11.8
1983	4.7	c/	10.0	12.5	14.7	12.5
B. Accelerated Decontrol in 1982 b/						
1980	3.5	c/	8.1	10.2	11.6	10.2
1981	4.0	c/	8.9	11.1	12.9	11.1
1982	6.9	c/	14.1	17.6	21.0	17.6
1983	7.6	c/	15.2	19.1	22.8	19.1
C. Full Decontrol in 1982 b/						
1980	3.5	c/	8.1	10.2	11.6	10.2
1981	4.0	c/	8.9	11.1	12.9	11.1
1982	8.1	c/	15.1	18.8	23.2	18.8
1983	8.2	c/	15.3	19.2	23.5	19.2

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a/ Irrigation and Crop-Drying

b/ Department of Energy Scenarios

c/ Not relevant, as irrigation and crop-drying operations are not typical for wheat production on a national level.

Source: Calculated by CRS using data furnished by U. S. Department of Energy, Data Resources Incorporated, The Fertilizer Institute, and the American Gas Association.

The dominant element of rising natural gas costs in farming is in fertilizers, and, in particular, nitrogenous fertilizers. Natural gas, which is a raw material or feedstock input to the production of these fertilizers (as opposed to a processing fuel), accounts for about one-third of the cost of nitrogenous fertilizers made from ammonia, according to one estimate.[1] Assuming fixed rates of application of fertilizer per acre [2] and a complete passthrough of embodied natural gas costs to farmers, rising natural gas prices would have a significant effect upon fertilizer prices and, therefore, upon farming costs.

Direct, on-farm production costs [3] due to natural gas decontrol become over time a somewhat larger share of total gas inputs in wheat and corn production. In the production of corn, they accounted for about 30 percent of total natural gas input costs per bushel in 1980, rising to 32 percent in 1983 under NGPA, 33 percent under accelerated decontrol, and 35 percent under immediate decontrol. In wheat production, direct, on-farm costs of natural gas are negligible owing to the fact that wheat acreage is normally not irrigated or further dried after harvest.

The analysis assumes that about 10 percent of all acreage under corn is irrigated, and that natural gas is used as a primary fuel for pumping on about half of the irrigated acreage (54 percent).[4] The other energy sources include: electricity (27 percent), liquified petroleum gas (9 percent), diesel (7 percent), and gasoline (4 percent). It is likely that gas would be the primary fuel only in those locations where it can be obtained at or near wellhead prices. Indeed, the U.S. Department of Agriculture reports that seven states (Texas, Kansas, Arizona, New Mexico, Nebraska, Oklahoma, and Colorado) account for 94 percent of total consumption of natural gas used for irrigation.[5] Under these circumstances, the natural gas component of total costs would be somewhat higher than projected in these states, and lower than projected in other states.

B. The Suppliers of Natural Gas Used on Farms.—The sellers of natural gas used on farms consist mainly of ammonia producers, ammonia being a major source of nitrogenous fertilizer, and of either gas producers or interstate and intrastate natural gas pipelines. The structure of these sources of supply is such that the cost of natural gas used by farmers can be determined effectivley by suppliers.

Only 110 companies operating 152 plants are identified as producers of nitrogenous fertilizers in the United States by the 1977 Census of Manufacturers. The industry is characterized by a high degree of concentration, such that a small number of producers account for a significant share of the total output of the industry. The four largest, which operate 18 plants, account for nearly 34 percent of the value of total shipments of the industry. The eight largest companies, which operate 29 plants, account for nearly 54 percent of the value of industry shipments. Most of the companies are small; about 55 percent of the companies account for less than 2 percent ot total industry shipments.[6] This degree of concentration of production in a small number of firms implies that the largest companies have some capability to influence the price of fertilizers. In any event, industries of this nature tend to price on a basis related to costs, and prices of fertilizers are likely to reflect the decontrol of wellhead prices of the important natural gas inputs.

One analyst, Professor Gardner of the University of Maryland, notes that many of those companies are located in states which favorable intrastate rates for natural gas can be obtained.[7] He suggests that, under NGPA, these companies could face difficulty in obtaining future supplies of natural gas, as reserves in these states are depleted and demand of the higher priority residential sector increases.[8] An Energy

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[1] Burce Gardner, *The Impact of Natural Gas Deregulation on the Farm and Food Sector* (A report prepared for the Natural Gas Supply Association, 1982), p. 10.

[2] Various estimates of sensitivity to the price of fertilizer suggest that this assumption has merit. Estimates of the price elasticity of demand for nitrogenous fertilizer are low. DRI estimates that a 1 percent increase in nitrogen fertilizer prices would result in a 0.27 percent reduction in the quantity demanded. See, DRI, Agriculture Review, Summer 1981, p. 62. Also, Gardner estimated that a 1 percent increase in nitrogenous fertilizer price would result in a percentage reduction in demand in the range of 0.33 to 0.41. See, Gardner, op. cit., pp. 15 f.

[3] These costs are incurred mainly for irrigation and crop-drying. Pesticides do embody natural gas; however, according to the Council for Agricultural Science and Technology, the share of the energy component of pesticides in total energy use in farming is approximately 1 percent. See, Council Report No. 68. Energy Use in Agriculture, 197. p. 13.

[4] Bureau of the Census. U.S. Department of Commerce. 1978 Census of Agriculture. The percentages cited in the text do not sum to 100 owing to errors in rounding.

[5] U.S. Department of Agriculture, "Energy and U.S. Agriculture: 1974 1978," ESCS, Statistical Bulletin No. 632, April 1980.

[6] U.S. Department of Commerce, Bureau of the Census. 1977 Census of Manufacturers: Concentration Ratios in Manufacturing. May 1981, Table 8, pp. 9-90.

[7] Texas, Louisiana, and Oklahoma.

[8] Gardner, op. cit., pp. 6ff.

Information Administration Study concludes that there is a tendency for intrastate rates to approach the levels of interstate rates for natural gas.[9] Therefore, it is possible that the cost of the gas component of nitrogenous fertilizers could rise significantly, and, given the structure in the industry, be passed on to users of fertilizer, the farmers.

Pipelines supplying natural gas purchased for direct, non-farm application must be expected to pass through the full increase in wellhead prices under decontrol. The pipeline constitutes the only economically and technologically feasible way to transport large volumes of natural gas. While wellhead prices vary according to local circumstances of demand and supply, and prices in new contracts are "rolled in" with lower prices in old contracts to make up the regulated price to end users, the big wellhead price increases with decontrol would quickly be reflected in the users' price. The farmer consumes so little natural gas that he would have little possibility to influence prices.

II. MARKET PRICES AND STRUCTURE FOR CORN AND WHEAT, 1980-83

A. Market Prices.—DRI projects that corn and wheat prices paid at the farm will be rising from 1981 through 1983. These projections are presented in Table 2. If they prove to be correct, corn prices, after falling 19 percent in 1981, are expected to increase from $2.50 per bushel in 1981 to $3.09 in 1983, an annual rate of 11.2 percent. Wheat prices, which fell by 4 percent in 1981, are projected to increase from $3.88 per bushel in 1981 to $4.18 in 1983, a rise of nearly 4 percent.

TABLE 2: DRI PROJECTIONS OF CORN AND WHEAT PRICES PAID AT FARM, 1980-83

[In dollars per bushel]

Year	Corn price	Wheat price
1980	3.10	4.06
1981	2.50	3.88
1982	2.83	3.94
1983	3.09	4.18

Source: DRI Agriculture Review. Winter, 1981.

B. Market Structure.—The market for farm products generally is characterized by a large number of sellers. The U.S. Department of Agriculture estimated the total number of farms in the United States in 1980 to be 2.4 million, 88 percent of them having sales of less than $100,000.[10] At least 934,000 farms produce some wheat; at least 1.5 million farms produce corn and other feedgrains.[11]

In addition to domestic producers, foreign sources of supply are substantial. DRI estimates that Canada, Australia, and Argentina will account for about 6 percent of world production of feedgrains, and the Soviet bloc countries will contribute 21 percent of total world production of these crops in 1982.[12] With respect to wheat production, DRI projects the U.S. contribution to world supply in 1982 to be 15 percent of the total.[13]

These data are important as they demonstrate that the individual seller is so small that determination of market prices is a function of the market-place. The single farmer is a price-taker, unable to influence the market price. The farmer cannot pass through to buyers of farm products additional costs of production resulting from changes in natural gas pricing. The farmer lacks the market power to recover the higher costs of production which can be imposed upon him by his suppliers who do have this market power. He can only hope to benefit from unforeseen factors, such as increased foreign purchases, that would boost farm prices, or from government policies that could have the same effect.

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[9] U.S. Department of Energy. Energy Information Administration. Intrastate and Interstate Supply Markets Under the Natural Gas Policy Act. October 19, 1981. p. 27.

[10] U.S. Department of Agriculture, Farm Income Situation, These data were obtained from the data bases maintained by DRI.

[11] U.S. Department of Agriculture data obtained by telephone, March 31, 1982.

[12] DRI Agriculture Review, Winter, 1981, p. 23.

[13] Ibid., p. 30.

III. EFFECTS OF NATURAL GAS PRICE DECONTROL ON CORN AND WHEAT FARM INCOME

In 1982, accelerated natural gas price decontrol could cost corn and wheat farmers $610 million dollars in constant 1972 dollars (i.e., after adjusting for inflation). In 1983, this cost would rise to $730 million. The costs resulting from immediate decontrol would amount to $790 million in 1982 and $1.80 billion in 1983. These estimates are the difference in each year between the value of farm cash receipts less natural gas expenditures under the decontrol scenarios and the value of these net receipts under continuation of NGPA.

Under accelerated decontrol, it is estimated that net cash receipts from corn and wheat farming in 1982 net of natural gas costs would amount to $21.65 billion dollars in 1972 constant dollars. They represent 97.3 percent of the $22.26 billion in farm cash receipts from corn and wheat which would be realized under NGPA. In 1983, net cash receipts would rise to $24.67 billion, 97.1 percent of the $25.40 billion which would be realized under continuation of current NGPA policy. These dollar values of farm cash receipts, total expenditures for natural gas, and farm cash receipts less natural gas expenditures are presented in Table 3.

TABLE 3: EFFECTS OF NATURAL GAS PRICE DECONTROL ON CORN AND WHEAT FARM CASH RECEIPTS, 1980-1983

(billions of dollars in 1972 prices)

YEAR	GROSS FARM CASH RECEIPTS	EXPENDITURES FOR NATURAL GAS a/	GROSS CASH RECEIPTS LESS NATURAL GAS EXPENDITURES
		A. CURRENT POLICY - NGPA	
1980	$ 20.83	$ 0.94	$ 19.89
1981	22.16	1.26	20.90
1982	23.49	1.23	22.26
1983	26.77	1.37	25.40
		B. ACCELERATED DECONTROL	
1980	20.83	0.94	19.89
1981	22.16	1.26	20.90
1982	23.49	1.84	21.65
1983	26.77	2.10	24.67
		C. IMMEDIATE DECONTROL	
1980	20.83	0.94	19.89
1981	22.16	1.26	20.90
1982	23.49	2.02	21.47
1983	26.77	3.17	23.60

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a/ Total production multiplied by gas cost per bushel from Table 1. Calculated by CRS using data from Table 1 and DRI Agriculture Review, Winter, 1981.

Under immediate decontrol, net farm cash receipts would amount to $21.47 billion in 1982, or 96.5 percent of the $22.66 billion which would be realized under NGPA. In 1983, these receipts would rise to $23.60 billion or 92.9 percent of the amount which would be realized under NGPA.

Farm cash receipts net of natural gas costs increase under all three scenarios but by most under NGPA. Under NGPA, net farm cash receipts from corn and wheat farming rise by 27.7 percent in the period 1980 through 1983. Under accelerated decontrol, the percentage increase is 24.0 percent; and under immediate decontrol, the percentage change is 18.7 percent.

However, under all natural gas pricing scenarios, the farmer's income position is eroded, assuming that other costs maintain their relative shares of of cash receipts. The effect of NGPA is to increase in 1983 the share of gross farm cash receipts accounted for by natural gas expenditures as compared with 1980. In 1983, these expenditures are estimated to be 5.1 percent of gross farm cash receipts in corn and wheat farming; in 1980, the share was 4.5 percent. Under both accelerated and immediate gas price decontrol, the farmer's net income position also worsens in 1983, assuming that other costs maintain their shares. The share of natural gas expenditures in gross farm receipts rises to 7.8 percent under accelerated decontrol, and to 11.8 percent under immediate decontrol.

IV. CONCLUDING COMMENTS

The estimates developed in this analysis clearly indicate that changing natural gas pricing policy would result in higher costs of production and, effectively, a lowering of net farm incomes. Buying inputs of natural gas in markets in which the farmer has little or no influence on input prices, and selling products in markets in which the individual farmer also has no control over price, there is little likelihood that the farmer can recover higher input costs by passing them through to consumers. Thus, the farmer's income is "squeezed" by higher natural gas prices resulting from policy changes.

APPENDIX—METHODOLOGY

I. NATURAL GAS PRICING SCENARIOS

All three scenarios are those developed by U.S. Department of Energy and published in: U.S. Department of Energy. Two-Market Analysis of Natural Gas Decontrol. Appendix A to "A Study of Alternatives to the Natural Gas Policy Act of 1978." Report No. DOE/PE-0033, November, 1981.

The NGPA scenario assumes continuation of current pricing policy in which only certain categories of natural gas would be decontrolled in 1985. It allows for partial application of incremental pricing rules, and assumes a real world oil price of $32.73 in 1980 dollars escalating at an annual rate of 3 percent.

The accelerated decontrol scenario assumes decontrol commences in 1982. Decontrol would be partial, applying only to the price categories of gas being deregulated under NGPA. There would be no incremental pricing. Oil prices are as in the NGPA scenario.

Immediate decontrol commences in 1982 and applies to all domestic gas. There is no incremental pricing.

The wellhead and industrial prices for those industries exempt from incremental pricing, including chemicals, are projected to be per thousand cubic feet (Mcf):

	1980	1981	1982	1983
NGPA:				
Wellhead	1.81	2.09	2.27	2.42
Industrial	2.71	2.97	3.15	3.33
Accelerated:				
Wellhead	1.81	2.09	3.56	3.92
Industrial	2.71	2.97	4.69	5.08
Immediate:				
Wellhead	1.81	2.09	4.19	4.27
Industrial	2.71	2.97	5.02	5.11

II. PROJECTIONS OF ACREAGE, FARM PRODUCT PRICES, AND FARM CASH RECEIPTS

All projections of acreage, farm product prices, and farm cash receipts are those estimated by Data Resources Incorporated and published in DRI. Agriculture Review, Winter, 1981.

III. TECHNICAL ASSUMPTIONS

Fertilizer application rates, obtained by telephonic communication from the Fertilizer Institute and the American Gas Association, are assumed to be 137 pounds of nitrogen per acre of corn and 58 pounds per acre of wheat. Approximately 21,000 Btu's of natural gas are required per pound of nitrogen. Based on yields per acre planted, the natural gas content of a bushel of corn is approximately 0.03 Mcf and, for wheat, 0.04 Mcf. Approximately 97 percent of all corn acreage is estimated by the Fertilizer Institute to be fertilized. Approximately 70 percent of all wheat acreage is fertilized.

Nitrogenous fertilizers are used in conjunction with other types of fertilizers, and are not substitutes for them.

Inputs of natural gas in irrigation and crop-drying operations were derived from estimates of the Council on Agricultural Science and Technology, as published in its report, No. 68: Energy Use in Agriculture (1977). The volumes of gas used in these applications were derived from data in the Oak Ridge Associated Universities Report: ORAU—160—Industrial Energy Use Data Book.

IV. ADDITIONAL ASSUMPTIONS

Five percent of acreage in corn is irrigated using natural gas as a primary fuel.

Purchases of natural gas for direct farm use are made at wellhead prices.

The price of natural gas embodied in fertilizer is completely passed through to the consumer.

STATEMENT OF STEPHEN BROBECK, EXECUTIVE DIRECTOR, CONSUMER FEDERATION OF AMERICA

Mr. Chairman and Members of the Committee. My name is Stephen Brobeck, and I'm Executive Director of the Consumer Federation of America. CFA is a coalition of more than 200 organizations seeking to represent the interests of all consumers, rural as well as urban. We greatly appreciate the opportunity to testify today on the subject of "Rural Energy Equity."

Two kinds of rural energy needs affect consumers. The most obvious are the needs of rural consumers pertaining to transportation, home heating, and other home energy uses. The second are those energy needs of agricultural producers that affect retail food prices paid by all consumers. In my testimony, I will discuss both types of need, then outline a national energy policy for meeting them.

ENERGY NEEDS OF RURAL CONSUMERS

63 million persons, 28 percent of the country's population, live in rural areas. Over two-thirds live in the South or Midwest. And only a small portion in the labor force, less than 20 percent work on farms. Partly because many new factories are being built away from cities, a large number of rural residents even work on assembly lines.

These rural consumers have somewhat different energy needs than their urban counterparts. In the first place, they use less natural gas, proportionately, but more electricity and fuel oil. As the table below indicates, rural consumers use roughly one-third of all the electricity and fuel oil consumed by households, but less than 15 percent of the gas.

RESIDENTIAL ENERGY CONSUMPTION, 1978–79

[In percent distribution]

	Urban	Rural	Total
All fuels [1]	76.1	23.9	100
Natural gas	86.8	13.3	100
Electricity	65.4	34.6	100
Fuel oil, kerosene	69.4	30.6	100

[1] Excludes gasoline used in transportation.

Source: U.S. Energy Information Administration, Residential Energy Consumption Survey: Consumption and Expenditures (1978–80).

On the average, these consumers are hurt far more by rising energy costs than are urban consumers. On the one hand, rural residents need more energy to subsist. Because rural housing tends to be older, more dilapidated, and more likely to be detached than urban units, rural units are less energy efficient. Forty years ago, this inefficiency was counterbalanced by the large concentration of rural persons in the South, where heating needs are less. Yet today, after several decades of migration from the rural South to urban North, rural residents reside at approximately the same latitudes as do their urban counterparts.

Those in rural areas must also do more driving. Distances between home and school, church, or market tend to be greater, especially for those living on farms. Few have the option of taking public transit since transit systems are practically nonexistent in rural areas. This is why, even though most farmers work at home, a higher proportion of rural than urban workers drive to work.

As well as needing more energy, rural consumers have lower incomes. At the upper end of the income scale, in 1975 52.5 percent of whites and 26.7 percent of blacks in metropolitan areas earned at least $15,000; only 30.2 percent of whites and 12.8 percent of blacks outside urban areas were paid this much. At the lower end, in 1978 10.4 percent of those living in urban areas, but 13.5 percent of rural residents were classified as poor.

For these and other reasons, rural consumers were hurt badly by rising energy prices in the 1970s. Their energy costs, and the proportion of their incomes allocated to meet this expense, both increased substantially. After declining between the late 1940s and 1970, the average residential cost per KWH charged by rural electric cooperatives, for instance, more than doubled between 1970 and 1980. Since rural consumers were also increasing their consumption in the 1970s, the electricity costs of those served by electric co-ops rose more than 150 percent.

ENERGY NEEDS OF FARMERS

As well as incurring rising residential costs, the some seven million persons living on farms also were forced to pay higher energy costs for agricultural production. Farm producers are especially dependent on petroleum which represents two-thirds of the energy actually used on the farm. Consequently, farmers were hurt badly by the 300 percent run-up in petroleum prices during the 1970s. The fact that they purchased most of their oil from farm cooperatives and independent refineries made their situation particularly difficult. Because co-ops and the independents enjoyed less access than the majors had to crude oil, farmers were hit especially hard when supplies were disrupted. In 1979, for example, cooperative refineries were operating at only 50 percent of capacity while those of the majors were using 85 percent capacity. The co-ops were also forced to pay more for their crude. The result, for farmers, was serious diesel fuel shortages and higher than average prices.

Like other rural residents, farmers are especially vulnerable to rising energy prices. In 1980, farm net income dropped to 61 percent of its 1979 level. In 1981, it was only 70 percent of the 1979 level. One has only to read the newspapers to learn that hundreds of thousands of farmers have been devastated by the combined effect of high energy prices and high interest rates.

Because they depend on farm production, urban consumers also are threatened by rising rural energy costs. The major threat here is another major disruption of supply, which could also disrupt food production and increase retail food prices. A 1980 U.S. Department of Energy study estimated that a 10 percent reduction in supply would increase raw commodity prices by 55 percent. CFAs energy specialist, Ann Lower, estimates that a 20 percent shortfall would kick oil prices over $5.00/gallon, imposing additional costs of more than $10 billion annually on farmers.

A major disruption is not such a farfetched prospect. Now that OPEC has cut back production and oil companies have drawn down inventories, the petroleum glut is disappearing and prices have resumed their rise. It is not hard to imagine another Arab boycott to protest Western support for Israel, or a cutback in Venezuelan production in opposition to U.S. and European backing of Great Britain against Argentina.

A NATIONAL ENERGY POLICY TO MEET RURAL ENERGY NEEDS

In sum, what all rural energy users need most is adequate supplies of moderately priced electricity and petroleum. We would argue that this need can best be met by the implementation of a national energy policy with four essential elements—assuring the economic viability of rural electric cooperatives, promoting conservation in rural homes and farms, creating an allocation mechanism available for use during supply disruptions, and leaving the National Gas Pricing Act alone. Let use discuss each briefly.

Rural electric cooperatives supply much of the electricity used by rural families and farms. Like investor-owned utilities which mainly serve urban areas, they have been victimized by high energy costs and high interest rates. Yet, because of low population densities in rural areas, electric co-ops have the additional burden of higher capital and capital maintenance expenses. For this reason, since the 1930s the federal government has provided a small subsidy to REC's taking the form, principally, of credit at below-market rates. Even then, rural consumers served by co-ops pay an average of 12 percent more for electricity than do their urban counterparts. Now, at a time when the entire electric utility industry is in a precarious position, the Administration is trying to eliminate the small subsidy to rural electric consumers. These attacks on the Rural Electrification Administration are shameless and shameful, and must continue to be resisted by Congress. If they are not, rural consumers and producers will suffer the consequences.

I should add that, like farmers and other utilities, rural electric cooperatives are desperately in need of less expensive credit. In an effort to address this problem, the National Rural Electric Cooperative Association has joined with CFA, the NAACP, the National Farmers Union, the American Public Power Association, the National Housing Conference, the U.S. Conference of Mayors, several unions, and other organizations to support low interest rate legislation recently introduced by Senator Cranston in the Senate. This bill, S. 2526, would extend the Credit Control Act of 1969 and would amend it to discourage such nonproductive uses of credit as most corporate takeovers.

Conservation is the second essential of a national energy policy to meet rural needs. Poor persons in rural areas will be hurt badly by the elimination of the federal government's low income weatherization program. As well as continuing low-income energy assistance, the rural poor need financial help in making their homes more energy efficient. In addition, the government should do whatever possible to promote greater energy conservation in farm production. It could, for example, encourage greater fuel efficiency in farm machinery and farm vehicles and reduced use of fertilizers and pesticides.

Finally, to prevent the agricultural system from breaking down during oil supply disruptions, the President needs the authority to allocate and price petroleum. Extending the Energy Petroleum Allocation Act would have met this need, and it is unfortunate that, last year, the President vetoed such an extension.

On the subject of controls, it is also important that the National Gas Pricing Act be left alone. The NGPA provides adequate inventives for exploration and drilling, prevents huge run-ups in the residential heating bills of more than 100 million consumers, acts to curb the massive shift of resources away from industrial users to energy producers and in our analysis and that of the American Gas Association, will not cause a significant fly-up in prices when the Act expires in 1985 if the "contracts problem" is solved. If old gas prices are decontrolled or the deregulation of new gas prices accelerated, the millions of rural consumers and farmers who depend on gas will be damaged severely. For example, the cost of fertilizer would rise dramatically. It is important for the Senate to oppose the efforts of the Federal Energy Regulatory Commission to tamper with the NGPA.

Let me conclude by stressing that the national energy policy I have outlined acknowledges the fact that, in today's world, the free market does not always allocate resources with maximum efficiency or equity. It is prudent for the federal government to take steps to minimize any future disruption from the loss of foreign energy sources. In a world in which energy supplies are being rapidly depleted, it is also prudent for the government to promote energy conservation. Finally, it is equitable for the government to assist rural consumers and producers in paying for higher energy prices than those incurred by urban residents.

Thank you again for the opportunity to comment on rural energy needs from a consumer perspective.

STATEMENT OF DR. ELIHU BERGMAN, EXECUTIVE DIRECTOR, AMERICANS FOR ENERGY INDEPENDENCE, WASHINGTON, D.C.

On behalf of Americans For Energy Independence (AFEI), a national public interest organization, I appreciate the opportunity to participate in these hearings on Rural Energy Equity to share our views on the state of national energy security and what remains to be done to increase it. A secure and reliable supply of energy is critical both to our ability to provide an adequate domestic food supply and our capability to maintain the major U.S. agricultural exports which are an important source of food for many foreign countries and an important source of income for our country.

AFEI first addressed the stake of American agriculture in energy security four years ago in a publication called "Farm to Table: The Food-Energy Link," which examines the critical role of energy in food production and consumption, from land preparation through garbage disposal. Approximately 16 percent of U.S. energy consumption is used for the production, processing, transportation, and preparation of food. Of U.S. energy consumption, only 3 percent is used for the actual production of food, most of it in the form of petroleum products for which there are no practical substitutes. Because of its essential oil usage, agricultural production is highly exposed to the consequences of an oil supply interruption, which would simultaneously involve shortages and higher prices for gasoline, diesel fuel, and fertilizers. Without a security system addressing the requirements of the agricultural sector, there can be no real rural energy equity.

It is regrettable that the nation cannot yet count on a secure and reliable energy supply. Nearly a decade after the first Arab oil embargo catapulted energy into the national consciousness, we still are exposed and we still are vulnerable.

We must not allow the present oil glut to obscure the exorbitant price we are still paying for our heavy OPEC habit. The fact that we spent nearly three times as much for imported oil in 1981 as our income from net agricultural exports--$71 billion versus $26.5 billion --places the cost of our continuing imported oil burden in proper perspective for today's hearing.

For the United States, the current energy outlook is deceptive. The more visible energy signals during the past year have been the declining gasoline prices caused by a glut of oil in world markets. The attractive facade conceals the ever-present reality that despite abundant oil supplies and more-or-less stable oil prices, the United States and our allies remain overly dependent on oil and immediately exposed to economic adversities that would be created by an unforeseen cutoff of major oil supply sources. Beyond the danger of a sudden interruption in oil supplies, there is the prospect that recent declines in oil consumption which created the glut will be reversed by a restoration of economic health in the United States and the other major consuming countries.

Even if post-recession oil consumption in the non-Communist industrial countries does not reach pre-recession levels, the rapidly growing requirements in the Communist and developing countries inevitably will exert increasingly significant pressure on global oil supplies in the longer run. By contrast to a 19 percent increase in oil demand in the industrial West between 1970-1981, which now is declining, the increasing demand in Communist countries grew at a rate of 95 percent and in the less developed countries by 73 percent during the same interval.

During recent weeks we have observed how Saudi reduction of its discretionary production has been manipulated to enforce OPEC production ceilings, maintain prices, and, for the time-being at least, deflate the glut. And in the likely event of a political upheaval on the Persian Gulf, all bets about physical conditions, market advantages, and the rest, are off.

It is precisely the prospect of an unforeseen interruption of oil supplies that is the clear and present danger to U.S. energy security. And it is a contingency for which we are least prepared. At our existing state of preparedness, the American agricultural sector, along with all other sectors of the economy and sections of the country, has no assurance that the required energy supplies, primarily petroleum products, will be available in sufficient quantity at predictable prices.

At present the United States and our allies obtain most of our oil imports from the Persian Gulf. By contemplating the sequence of events that would follow in the wake of a sudden interruption of Gulf oil supplies, we can appreciate the fragile condition of Western energy security and the critical need to do all we can now to protect ourselves with an effective energy emergency structure. The most significant oil interruption would result from a regime change in Saudi Arabia, which is the most likely prospect. A Saudi successor regime, involving a coalition of Islamic traditionalists with modernists in the military and the growing Saudi bureaucracy, would be inclined to adopt a conservationist position on Saudi oil production. As the new regime imposed an oil policy that the growing cadre of professional Saudi planners and economists have been unsuccessfully recommending for years, oil production levels would be reduced to about 2 million barrels a day, immediately taking 5 million barrels off the market.

The last time 5 million barrels a day was suddenly removed from the system, following the Shah's departure from Iran in late 1978, the world markets were seized with a frenzy of panic buying, distorting and curtailing supplies and doubling oil prices. The market reaction to a major Saudi reduction would be a repeat performance of 1979.

While the United States derives only 7 percent of its crude oil requirements from Saudi Arabia, the other major industrial consumers are far more dependent. Germany presently relies on the Saudi source for 25 percent, Japan for 33 percent, France for 54 percent, and Italy for 68 percent of their oil consumption. In terms of total energy requirements, while Saudi oil accounts for only 3 percent of U.S. energy use, it represents 9 percent of German energy consumption, 19 percent of Japanese, 22 percent of Italian, and 24 percent of French. Together, all five countries currently use about 4.6 million barrels a day of Saudi oil, the amount that is likely to be cut off by a new Saudi regime. Under the circumstances, it is understandable that our allies would lose little time in scrambling to protect themselves at any cost if their Saudi supplies were jeopardized.

The creation of national energy security involves immediate and longer term objectives, which the nation must address simultaneously, and in which the federal government must take the lead. In the near term, the development of a workable and believable system to protect the country against the adversities of a sudden and unforeseen energy emergency should be a first order of national business. We do not yet have such a system. Today's stark reality is that if an energy emergency occurred tomorrow, there would be chaos. Whatever the fanciful notions expressed by the Administration about the capabilities of the free market in determining our energy priorities, the marketplace cannot provide an emergency preparedness system. This clearly is a job for government, and we would urge the Administration to get on with it.

A growing Strategic Petroleum Reserve, coupled with a system for its distribution, is our first line of defense against an energy emergency. The Strategic Petroleum Reserve, an oil stockpile, was started in 1977 to provide a cushion in case of an oil cutoff. The current target for the SPR is 750 million barrels of crude oil by 1987, which at today's import rate, would meet our requirements for approximately six months.

By accelerating a slow start, this Administration brought the stockpile to 230 million barrels by the end of 1981 (at the current rate of imports,55 days' worth).

But the fiscal year 1983 budget request suggests that the Administration is turning back on a commitment to Congress to maintain the SPR accumulation at an accelerated pace and would delay its completion by two years.

Beyond the existence of an adequate SPR, there is the issue of how the Reserve and other resources will be employed should an emergency strike. The SPR is concentrated in Texas and Louisiana. The major oil consumption is concentrated in other regions of the country such as the Northeast and the Midwest. How will the essential needs of these regions and others be met and how quickly?

Clearly, a plan should exist specifying the proposed utilization of the Reserve under simulated emergency conditions, to ensure that available transportation systems will be able to rapidly distribute the crude oil to refineries and the refined product to all parts of the country on the basis of need, so that no region will be left with inadequate supplies.

Yet we are told by the Administration that detailed contingency plans do not exist. This is indeed a sobering disclosure after experiencing two oil shocks in the last nine years and with another one lurking on the horizon.

The Administration tells us that the market place will deal with shortages in the event of an emergency, and scarce supplies will be allocated by higher prices. Ideological incantations about the role of the free market, which continue to pervade Administration statements about emergency preparedness, are no substitute for the design of a system and procedures for its activation and use. Emergency preparedness, like national defense, is a government responsibility.

AFEI has therefore testified in favor of S.2332, as recommended by the Senate Energy Committee, which mandates both the maintenance of an accelerated fill rate for the SPR and the creation of an Emergency Preparedness System.

As a parallel goal of national energy policy, while we create a buffer against an unforeseen contingency, we simultaneously must continue to address the longer term solutions to U.S. energy dependence. In doing so, our objective should be an energy consumption pattern in which the non-essential uses of oil are substantially reduced by the substitution of alternative energy resources that are produced in the United States. More than 40 percent of our oil consumption still is employed in household, commercial, and industrial applications for which another energy resource can be substituted. The provision of incentives and the removal of barriers for substituting coal, natural gas, and electricity produced from coal and nuclear energy, wherever these alternatives can be used, remains an imperative for the achievement of national energy security.

Where oil continues to be the essential energy source, we need to encourage its more efficient use and access to new technologies that increase efficiency. The new generation of U.S.-built fuel efficient automobiles, too many of which are sitting in dealers' inventories, is a high value asset for substantial reduction of oil consumption. For all energy resources, more efficient usage in homes, farms, businesses, automobiles and factories has demonstrated a significant potential. But the pricing system alone is not adequate to achieve maximum efficiencies. We still need conservation extension programs that have been initiated at the several levels of government during recent years.

Meanwhile, market prices for oil are rising from their April lows and for lack of an aggressive strategy to exploit the world oil surplus and the weakness of OPEC, the United States stands idly by. As an ironic expression of indifference to the OPEC assertion of continuing influence, the Administration early this week submitted proposals to the Congress to shut down the Department of Energy. By doing so the Administration announced its determination to walk away from the energy problem. This flight from responsibility by an Administration supposedly committed to the enhancement of our national security is not likely to inspire confidence among those involved in American agriculture, a sector of the economy deeply affected by existing energy insecurities.

Like the national defense, the achievement of energy security remains a government responsibility. The cost of a barrel of imported oil is not established by its market price. There is a national security premium still associated with every barrel of imported oil and a national security cost to the nation imposed by our continuing energy dependence. Until oil and energy are restored to conventional market items, the government cannot abdicate a leadership role in providing for national energy security.

STATEMENT OF R. THOMAS VAN ARSDALL, VICE PRESIDENT, ENERGY RESOURCES, NATIONAL COUNCIL OF FARMER COOPERATIVES

Mr. Chairman and Members of the Subcommittee:

My name is R. Thomas Van Arsdall, Vice President, Energy Resources, of the National Council of Farmer Cooperatives. The National Council is pleased to have the opportunity to appear before this Subcommittee to discuss the subject of "Rural Energy Equity."

The National Council of Farmer Cooperatives is a nationwide association of cooperative businesses which are owned and controlled by farmers. Its membership includes 117 regional marketing and farm supply cooperatives, the 37 banks of the cooperative Farm Credit System, and 31 state councils of farmer cooperatives. National Council members handle practically every type of agricultural commodity produced in the United States, market these commodities domestically and around the world, and furnish production supplies and credit to their farmer members and patrons. Two-thirds of United States farmers are affiliated with one or more cooperatives. The National Council represents about 90 percent of the more than 6,400 farmer cooperatives in the nation, with a combined membership of nearly 2 million farmers.

Among the cooperatives the National Council represents are supply cooperatives which own and operate 5 efficient refineries which have an aggregate production capacity of about 301,000 barrels per day, and whose yields of gasoline, diesel fuel and heating oil amount to approximately 85 to 90 percent of their refined products. While this represents only 2.5 percent of United States refining capacity, cooperatives market petroleum products in more than 40 states and currently supply about 45 percent of all on-farm fuel and a large portion of rural needs.

The Chairman and members of the Subcommittee are to be commended for conducting timely hearings on a matter of critical importance--rural energy equity.

Mr. Chairman, last year you took the early lead in representing agriculture's vital interests during the legislative debate on emergency energy preparedness. Among other actions taken, you held hearings before this Subcommittee, introduced a Senate Resolution on the need to assure continued fuel supplies for agriculture, and cosponsored a comprehensive bill with Senator Durenberger, which ultimately evolved to final legislation. Your personal commitment was evident when you became involved in the Senate debate, working with Senate Energy Committee Chairman McClure, and meeting with top Presidential Aide Ed Meese in an attempt to reverse the Administration's opposition to this legislation.

Perhaps you said it best when you declared in your floor statement introducing Senate Resolution No. 139 last year:

> "It would be the height of folly to jeopardize the critical economic activity of the individual farmer and the entire agricultural system in serving one of the most basic human needs--that of food. In order to continue to perform this vital role, agriculture must have uninterrupted access to essential fuels."

Mr. Chairman, I want to congratulate you for your leadership on behalf of agriculture in continuing to address this issue.

The National Council's testimony today describes (1) the critical role played by energy in the U.S. food and natural fiber system,

(2) the present state of emergency preparedness policy, (3) changes in the structure of the rural petroleum system, and (4) the implication for agriculture of energy taxes in the current budget debate.

TIMELY ENERGY SUPPLIES CRITICAL TO FULL FOOD AND NATURAL FIBER PRODUCTION.

Agriculture is the backbone of the U.S. economy. Not only does the agricultural community provide the food and fiber essential to the health and economic prosperity of the United States, but, in a very real sense, feeds the rest of the world as well. Perhaps no element of our economy fulfills such a crucial, global responsibility. If agriculture in this country were unable to meet that responsibility efficiently, the effects would be felt all too swiftly on a world-wide scale.

Less than 3 million farm families produce enough food and natural fiber to feed and clothe 225 million Americans. The same farm families also export enough agricultural products to pay for half of our oil import bill.

The high level of U.S. agricultural productivity, taken for granted by many, depends heavily on critical petroleum fuel inputs to convert energy from the sun into food and natural fiber. By adopting technologies heavily based on fossil fuels, farmers have doubled output levels since 1940, without using more crop land. Labor productivity has increased tenfold during that time, with one farmer now producing enough to feed himself and 60 others.

Given the vagaries of nature, timing is critical to farm operations. Even a short disruption of fuel supplies at the wrong time can result in crop losses and reduced yields for that year. Similarly, processing and distribution operations must have uninterrupted fuel supplies to avoid spoilage and to assure that food ultimately reaches the consumer's dinner table.

Farmers and other components of the food and natural fiber system must have fuels in sufficient quantities and at the appropriate time and place to ensure full food and fiber production. Fuel shortages in this system can place unacceptable burdens on the American consumer. One USDA study estimated that a 10-percent fuel shortage at the farm could lead to as much as a 55-percent increase in farm commodity prices. Sharp rises in energy costs, even in the absence of shortages, are also obviously cause for concern. Such increases could impair the ability of many family farms to survive. Costs that can be passed on through the food system have a heavy impact on wholesale and retail food prices. For example, each 10-percent increase in energy costs across the food system can raise food prices about 1.2 percent. Food accounts for about 17 percent of total consumer expenditures--increasing to about 40 percent for low income groups.

U.S. REMAINS VULNERABLE TO ANOTHER OIL CUTOFF.

The energy crisis is by no means over--it is merely in a fitful slumber. During the temporary oil glut of the past two years, we had valuable time to increase our ability to respond to future disruptions. How well have we taken advantage of this opportunity?

Oil Decontrol and SPR Gains. On the plus side, this Administration has taken two key steps. First, by completing the decontrol of oil as one of its first actions, President Reagan eliminated the burdensome shackles of continuous overregulation on our domestic petroleum industry. Second, this Administration has moved aggressively to place crude oil in the Strategic Petroleum Reserve (SPR). The current level of approximately 250 million barrels means that for the first time the United States has as a policy alternative the offsetting of oil shortages.

The private sector has also taken positive steps. Home owners, farmers and business have responded to rising energy prices by (1) conserving fuel where possible, (2) storage facilities have been added, and (3) investments have been made in alternative energy sources.

No Emergency Preparedness Planning. However, in many respects a golden opportunity has been wasted. In particular, there is no cohesive energy policy in the United States. Most notable is the careful, year-long process by the Congress to develop comprehensive standby emergency preparedness authorities, which most regrettably culminated in the presidential veto of the Standby Petroleum Allocation Act of 1982 (S. 1503) by President Reagan. This means that no allocation or pricing authorities, including crude sharing and agricultural priority provisions, are available on the shelf as response options during a disruption. Under the banner of the free market, good programs have been thrown out with the bad.

The National Council is deeply concerned that the Administration's commitment to a free market--one which we share when such conditions exist--has ignored the harsh realities that accompany oil supply emergencies. As a result, there has been a distinct absence of emergency preparedness planning over the past two years, even under existing authorities. In particular, the only existing drawdown plan for the Strategic Petroleum Reserve is so general that almost every crucial decision which must be made for its practical implementation has been postponed. This means that should the SPR ever have to be called upon, development of a truly operational plan would have to occur in a crisis atmosphere with no lead time.

Inventory Drawdown Signals End of Glut. Mr. Chairman, the so-called "oil glut" is now a thing of the past. Oil companies and end users alike have finally succeeded in eliminating excess inventories which had been built up following the Iranian Revolution. Crude oil and product inventories have dropped by more than 120 million barrels in the United States over the past few months. Inventories have now been reduced to the minimum level necessary to conduct normal operations.

This is not to say that these actions have been irresponsible. For example, farmers are caught in a vicious cost-price squeeze. High interest rates mean that it costs from $8 to $12 per year to store a 42-gallon barrel of diesel fuel (about 25¢ per gallon). In an attempt to survive the Depression-level farm economy, they have attempted to reduce costs and cut inventories wherever possible. Other industrial users, refiners, and oil jobbers and marketers have taken similar actions, simply in an attempt to survive. This concern is currently far more immediate and crucial to most businesses than is the omnipresent but uncertain threat of oil shortages.

The myth of private inventory management as a response to future disruptions formed much of the reasoning for the Presidential veto of S. 1503. Administration officials believed that passage of S. 1503 would discourage a buildup of private stocks. These subsequent drawdowns in inventories have clearly shown that the presence or absence of emergency preparedness authorities is not a determining factor. On balance, an overall assessment of emergency preparedness capabilities strongly suggests that we are worse off now than before the Iranian shortage. A detailed GAO study released on

September 30, 1981 reaches the same conclusion.

Farm Fuel Shortages this Spring. As a result of this huge inventory drawdown, farm fuel shortages of both gasoline and diesel fuel are evident in much of the Midwest and Great Plains this Spring. When the surge of demand for Spring planting occurred, sufficient supplies were not in place. The distribution system could not logistically move product quickly enough. The problem has reached potentially serious levels in a number of areas, including in the State of North Dakota. It is likely to persist for several more weeks before the system can finally adjust.

These circumstances again illustrate how tenuous the rural petroleum supply lines really are, even in the absence of a supply disruption. Our continuing concern is how quickly serious regional shortages could emerge in the event of another disruption. There is no evidence of active consideration by officials in the Administration on how to deal with such a scenario should it occur. We simply cannot afford to play "Russian roulette" with this nation's agriculture.

Northern Tier Setback. On a separate note, the energy security of North Dakota and neighboring states has been dealt a severe blow by the failure of the State of Washington to issue the final permit necessary for construction of the Northern Tier Pipeline. This pipeline would have moved Alaskan crude oil into the American heartland. While emergency preparedness legislation is important, there is no true substitute to having access to secure domestic crude oil supplies. It is unfortunate that one permit out of a thousand could halt so vital a project.

Agriculture Well Represented in Energy Policy Debate. Mr. Chairman, you were the first to step forward over a year ago and represent agriculture's interests in the emergency preparedness debate. You started the process by holding hearings before this Subcommittee, in which the agricultural community unanimously called for emergency preparedness authorities and planning. You then introduced Senate Resolution No. 139, which addressed the overriding need to assure continued fuel supplies for agriculture, and the critical role of crude oil access to cooperative and other independent refiners serving rural markets. You then joined with Senator Durenberger in sponsoring the Standby Petroleum Disruption Management Act of 1981 (S. 1476), a comprehensive bill addressing emergency preparedness policy for agriculture and the nation. Several of your colleagues on this Subcommittee joined with you in these efforts. You took additional steps to work with Senate Energy Committee Chairman McClure to develop and secure passage of S. 1503. Your personal meeting with White House Counselor Ed Meese was a valiant attempt to avert the presidential veto which ultimately occurred. The National Council has been most pleased to support you in these endeavors.

Current Emergency Preparedness Initiatives. These hearings are ample evidence that you are still searching for ways to achieve responsible and effective emergency preparedness planning, consistent with the best interests of agriculture. We know that you have continued to work with Senators McClure, Jackson and Durenberger on emergency preparedness amendments to other legislation (S. 2332, IEA antitrust exemption). While these amendments do not address the pricing, allocation, and agricultural priority provisions contained in S. 1503, they do call for the development of contingency plans under existing authorities. A major new dimension is the increased emphasis on continued filling of the SPR and development of a drawdown plan for use during emergencies. This key provision was part of your original legislation. Under existing law, the new SPR drawdown plan is supposed to consider, to the maximum extent practicable, the needs of agriculture and other priority users. For all practical purposes, the SPR is now this nation's only practical line of defense against future disruptions.

We understand that, while the Administration is not supporting these amendments, the threat of a veto is minimal. The key is how effectively the Department of Energy, or its successor in the Department of Commerce, implements these legislative mandates.

Mr. Chairman, we hope that you will use your office to help secure final passage of this legislation and to monitor closely the development of studies and contingency plans, to ensure that agriculture's concerns are addressed.

A Continuing Legacy. On a final note, it is important to remember that farmers and the national economy are operating under a continuing legacy of the 1979 oil disruption. Following that disruption, oil prices shot up 160 percent. In spite of a glut for the past two years, prices have declined only about 10 percent. This ratchet effect of disruption-driven price increases awaits only another disruption to spark a new surge. Our ability to respond to such events, through use of SPR oil or other measures, will determine the magnitude of the next increase.

To place the economic effects of the last disruption in true perspective, we estimate that the 160-percent oil price increase means that farmers now spend as much as $5 billion more for their petroleum fuels. Contrast this increased input cost alone with the Depression-level farm income levels, which are forecast to be from 13 to 18 billion dollars for this year.

CHANGES IN THE RURAL PETROLEUM SYSTEM.

The U.S. petroleum system is currently engaged in the throes of considerable change as a result of market forces which have evolved in response to sharp energy price increases following the last disruption. Farmers and other users have conserved. This, combined with the recession, has resulted in a significant decline in the demand for petroleum fuels.

The refining industry has been running at an average of 64 to 67 percent of capacity for more than a year, compared with the previous average of 85 to 90 percent. A number of refineries have been mothballed or permanently closed down. Jobber and marketer operations have been consolidated.

The withdrawal from many rural markets by major oil companies as a part of this process has been a major trend. This leaves fewer refiners, marketers and jobbers to serve the farm and rural economy's needs, with an increased reliance upon farmer cooperatives and other independents.

Farmer Co-ops Adjusting to Member Needs. The farmer cooperative petroleum system is also evolving in response to the changing dynamics of the marketplace. For example, two refineries are being shut down. with other remaining refineries to be run at higher capacity. One refinery is being expanded by one-third to take advantage of economies of scale and to increase its ability to run different kinds of crude oil. Another co-op-owned refinery is also reconfiguring so that it can run so-called "sour" crudes. These moves and investment decisions are being undertaken in order that farmer-members may continue to receive adequate supplies at the minimum cost possible.

Regional cooperatives in the petroleum supply business are presently evaluating the needs of their farmer-members and taking steps to adjust their marketing system as necessary. Questions such as the new role of propane in the power fuel market, key-operated service outlets, and better methods of bulk delivery are all being carefully assessed. Indeed, cooperative managers will be meeting three weeks from now to hear from outside experts on the future of OPEC and on the changing domestic marketplace, to assist in their search for answers.

Oil Pipeline Deregulation Bad News for Agriculture. There is one piece of legislation in the early stages of consideration by the Senate which causes us deep concern and has potentially devastating implications for rural petroleum users. S. 1626 is a bill which would deregulate the regulatory and rate-making process for oil pipelines. Most farmer cooperative and other petroleum suppliers in rural areas find themselves as captive shippers to a single pipeline in any given market area. These natural monopolies have evolved due to the tremendous economies of scale and efficiencies provided when a single pipeline meets the needs of a market territory. For longer distances over land routes where barge transportation is not a practicable alternative, as in North Dakota, there is no remotely competitive alternative for moving petroleum.

Absent any accountability in the rate-making process, the increased rates charged by pipelines in such circumstances would directly add to the farmer's costs of production, as well as to the living expenses of his rural neighbor. We are not opposing deregulation in and of itself, and the National Council is by no menas satisfied with maintaining a status quo. Numerous studies have documented the inadequacies of the present regulatory structure. National Council members are presently searching for ways to protect the interests of petroleum users, while maintaining a fair rate of return to the pipeline owners.

Mr. Chairman, given the potentially negative impacts on the agricultural community, we hope that you will keep a watchful eye on this legislation.

Economic Impact of Energy Taxes on U.S. Agriculture. The current budget debate is focusing upon energy as a major source of additional revenues to help offset huge deficits. One alternative receiving active consideration is a $5-per-barrel oil import fee. The National Council opposes this measure as being the most inequitable way of meeting general revenue needs. The negative impacts are focused entirely upon users of petroleum products, including farmers and home heating oil customers. These users are also among those least able to adjust. Such a fee would cost farmers about $1 billion annually in additional petroleum fuel costs for farm operations alone. Farm income could be reduced by as much as 8 percent at a time when farmers are facing a severe economic crisis. The long-term ripple effect on other energy forms, such as natural gas, could easily double the impact on agriculture.

If energy must be taxed, we would hope that it would be as broadly based as possible, so that no individual user bears a disproportionate share of the burden.

OTHER ENERGY CONCERNS.

A number of other issues will continue to arise in the energy area which could have significant impact, both directly and indirectly, on rural energy equity.

Future of Alternative Energy Sources Uncertain. The future of alcohol fuels certainly remains a big question mark. The Administration's decision to sharply reduce its participation in the development of alcohol fuels and other alternative energy sources has had a dampening effect upon such projects. High interest rates, the temporary levelling off of oil prices, and the depressed economy have also contributed heavily to this slowdown period. Regrettably, it may take another oil emergency to spark renewed activity.

Gas Decontrol Looms on the Horizon. The natural gas decontrol debate will probably occur with full force in 1983. The National Council is deeply concerned about the implications that this issue holds for American agriculture. Sharp or unnecessary increases could add to the heavy burdens already carried by agriculture. Yet regional price disparities and potential shortages, among other concerns, are emerging which must be dealt with.

Refiner Overcharge Violations. Another issue out of the past has residual economic effects upon farmer cooperatives and their members. Billions of dollars of violations are alleged to have occurred by refiners during the 1973-1981 era of price controls. Much of this money rightfully belongs to farmers. Legal precedent has been established which would require the Department of Energy to provide a mechanism in which injured parties who could document their purchases would be reimbursed directly before other settlement approaches are explored. The cooperative system has been recognized as a way of accomplishing this objective. In some cases, we are encouraged that DOE officials are pursuing this path in good faith. However, we are increasingly concerned that some settlements are being negotiated which ignore the interests of directly injured parties, such as farmer cooperatives. In the Chevron case, all funds were turned over to state governments. We know of at least 15 farmer cooperatives who purchased petroleum product from Chevron. Another approach considered is to leave the money in the Treasury. We would hope that the Department of Energy makes every reasonable effort to see that settlement funds are reimbursed to appropriate parties.

The National Council thanks you for the opportunity to offer our views on these important issues. We would be pleased to answer any questions that you may have.

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